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UNIVERSITY AREA TRANSPORTATION PLAN

Champaign-Urbana, Illinois

Prepared for
City of Champaign
City of Urbana
Champaign-Urbana Mass Transit District
University of Illinois

By Barton-Aschman Associates, Inc.
Evanston, Illinois

June, 1979

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CONTENTS

List of Figures and Tables, iv

1.
INTRODUCTION 1

2.
PLANNING ISSUES AND OBJECTIVES 2

Existing Systems 2
Historical Transportation Plans and Proposals 13
Problems and Issues 14
Barriers to Problem Solving 14
Recap of Issues 15
Planning Objectives 16

3.
ALTERNATIVE TRANSPORTATION CONCEPTS 19

Planning Approach 19
Specific Alternatives 26

4.
EVALUATION AND SELECTION 38

Initial Screening 38
Alternatives Eliminated 39
Elements Modified 40
Capital Cost Implications 41
Evaluation Analysis 49
Selection 63

5.
RECOMMENDED PLAN 65

Plan Elements 65
Implementation 85

APPENDIX 89

LIST OF FIGURES AND TABLES

Figures

1. Existing Traffic Circulation System 4
2. Existing Traffic Volumes 5
3. Existing Parking Facilities 9
4. Existing Transit Routes 11
5. Existing and Planned Bikeways and Pedestrianways 12
6. Alternative Parking Concept A 28
7. Alternative Parking Concept B 29
8. Alternative Parking Concept C 30
9. Alternative Circulation Concept A 32
10. Alternative Circulation Concept B 33
11. Alternative Circulation Concept C 35
12. Alternative Circulation Concept D 36
13. Alternative Circulation Concept E 37
14. Recommended Circulation System 66
15. Transit Route Modifications 70
16. Off-Street Parking System Modifications 72
17. Bikeway and Pedestrianway Modifications 74
18. Prototypical Special Street Cross Sections 77
19. Wright Street Design Concept 79
20. Mathews Street Design Concept 80
21. Gregory Drive Design Concept 81
22. Traffic Control Concept 82
23. Potential Staging Concept 88

Tables

1. Summary of 1977 Accident Experience 7
2. Estimated Construction Cost for Parking Lot Consolidation—Concept A 42
3. Estimated Construction Cost for Parking Replacement—Concept B 43

4. Estimated Construction Cost for Satellite Parking—Concept C 44
5. Estimated Construction Cost for Circulation—Concept B 44
6. Estimated Construction Cost for Circulation—Concept D 45
7. Estimated Construction Cost for Circulation—Concept E 47
8. Estimated Peak-Hour Traffic Volumes for Circulation Concepts 53
9. Estimated Changes in Peak-Hour Traffic Volumes Produced by Alternative Parking Concepts 54
10. Expected Performance by Alternative Concepts: Circulation and Land-use Relationships 58
11. Preliminary Special Street Design Objectives 76
12. Estimated Project Costs 87

1.
INTRODUCTION

This report summarizes the results of a multimodal transportation study undertaken for the area surrounding the University of Illinois campus. The project concerned safety and transportation systems operations for auto, transit, bicycle, and pedestrian modes. This document includes data and planning findings initially discussed in a series of work papers published during the course of the project.

The data base used for this study was obtained via review of previous transportation, traffic, transit, bikeway, and other planning reports; the compilation of a substantial amount of information from current staff files, and limited field reconnaissance. No new data gathering activities were undertaken.

During the course of the study, a series of presentations and dicussions were held to involve all participants in the progress of the work. These concerned the following: issues clarification, alternative development, alternatives cost analysis, evaluation results, and preliminary plan development. The purpose was to obtain consensus for the plan as it was evolving through these various steps.

The consultant acknowledges the significant assistance provided during this study by staff representatives of the City of Champaign, City of Urbana, Champaign-Urbana Mass Transit District, and the University of Illinois.

2.
PLANNING ISSUES AND OBJECTIVES

The motivation for this study stems from a recognition of various safety, traffic flow, and other transportation-related problems in the general area of the university, i.e., the area around the central core of the campus where there is a transition between the community and campus orientation, land-use, and transportation systems. Specifically, the study area is contained by University Avenue, Lincoln Avenue, Windsor Road, the IC Railroad tracks, and First-Green-Fourth Streets.

The area is characterized by a concentration of activities including the five transportation system elements: vehicle circulation, parking, transit, bikeways, and pedestrianways. Because of the level of activity and inherent competition for space, a variety of conflicts occur. It was the objective of this study to sort these out and develop recommendations to accommodate the demand for transportation. The time frame is generally short range, i.e., within five years.

Existing Systems

The first step is to define the issues and problems. This is tantamount to describing an agenda to be addressed in the planning phase of the work. A review of the existing systems in terms of problems, issues, and recommendations as presented and discussed in previous studies[1] is the initial step.

Specifically, the review was intended to crystallize problems and ideas into a framework leading toward a consensus on the higher priority problems and then to specification of a set of logical and comprehensive planning objectives and principles. These principles are crucial to the development of alternative solutions of transportation system problems in the study area.

In addition to discussing the functions and operation of the total transportation system in terms of individual modes, the review serves as the basis for examining the range of previously proposed plans and recommendations and the extent to

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[1] See Bibliography (in Appendix).

which any or all of them begin to address the complex transportation needs of the university area. Together, two questions are considered: what are the real and consistent transportation problems and issues and what "barriers" have prevented their solution? These findings reflect the "needs" to be addressed by converting them into a general study approach using systematic methods to produce a workable and potentially implementable solution.

As noted above, there are five major components of the total transportation system:

- Overall vehicle circulation system.
- Parking and service access sytem.
- Transit system.
- Bikeway system.
- Pedestrian system.

Each of these components is described in the following sections with the intent to capsulize important aspects and provide some insight into strengths and weaknesses.

Vehicle Circulation System

Figure 1 illustrates a functional classification for the existing university area circulation system. It is significant that in reality many of the close-in streets (i.e., Green Street) are required to serve more than one function—arterial as well as collector (possibly local). This is complicated by the rather close spacing of arterials (Green-Springfield, Goodwin-Lincoln). As a result, the system lacks clarity and continuity. Significant volumes of non-university-bound traffic are being accommodated on roadways, particularly Green Street; logically, this type of traffic should be farther away from the core of the campus area. In addition to these operational issues, the roadway system appearance and its corresponding traffic control system do not foster the separation of through traffic from internally circulating traffic. The continuity or completeness of the functional system is further hampered by the imbalance in one-way street movements. For example, Sixth and Wright Streets attempt to operate as a one-way couple, but balanced return flow does not occur, nor are the two streets comparable in traffic function; Sixth Street is a major traffic artery and Wright Street serves more as a local collector/distributor.

Figure 2 summarizes the traffic volumes observed on the major study area streets in 1976. While the facilities or corridors are not yet significantly deficient in lane capacity, the analysis does suggest that they will likely develop such deficiencies in the near future. Because many of the principal intersections along arterials are already approaching capacity[2]—University, Green, and Florida—the exploration of alternative operational and functional as well as new development changes will have important effects on the distribution patterns and corresponding levels of service, and must be considered carefully.

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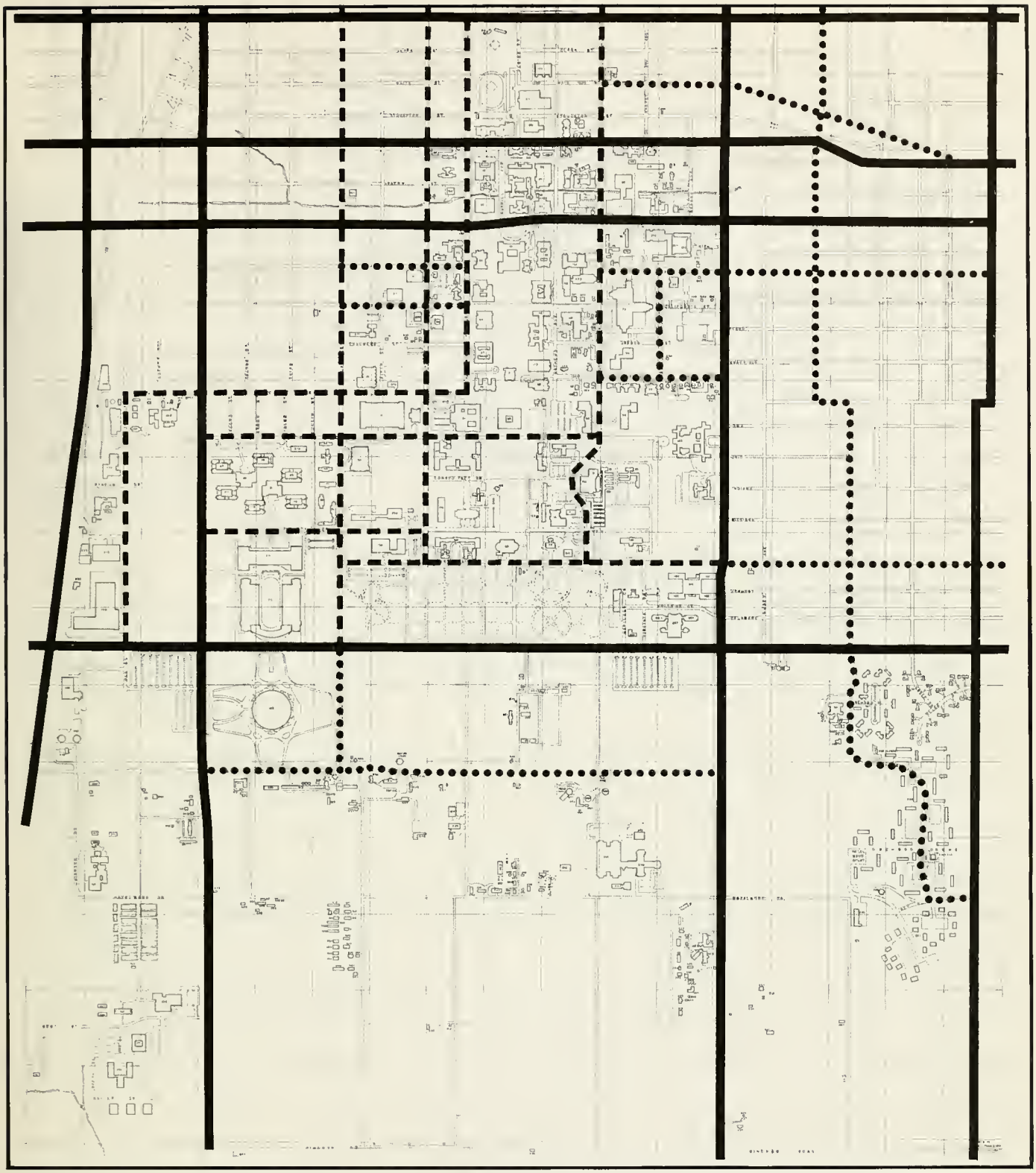
[2] Level of Service C; congestion during short-term peaks (less than one hour) is even more intense.



UNIVERSITY AREA TRANSPORTATION PLAN

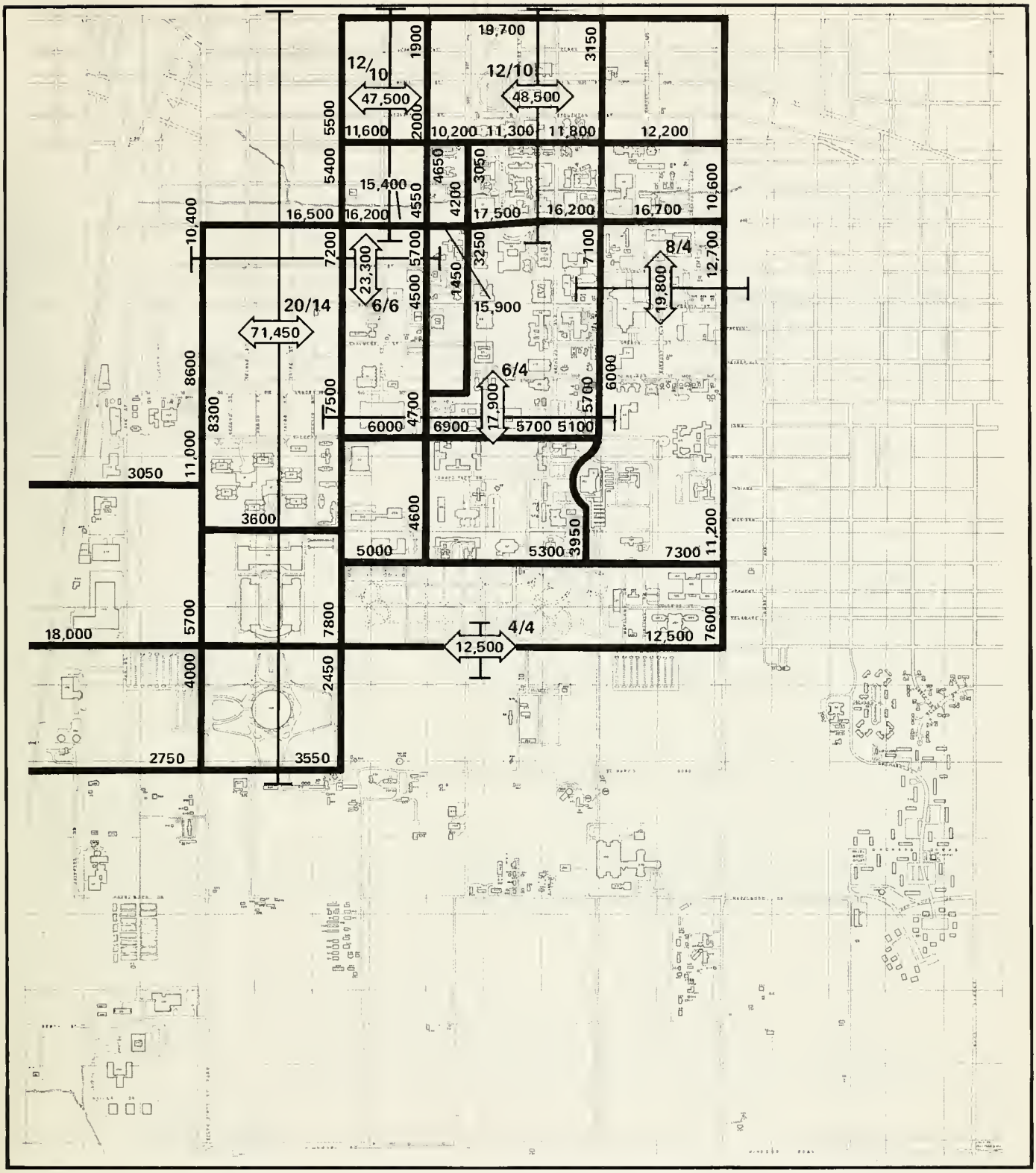
THROUGH STREET

MAJOR COLLECTOR STREET

MINOR COLLECTOR STREET

Figure 1

EXISTING TRAFFIC CIRCULATION SYSTEM



UNIVERSITY AREA TRANSPORTATION PLAN

ADT

LANES EXISTING
LANES REQUIRED

Figure 2
EXISTING TRAFFIC VOLUMES

As a result of the recurring capacity problems, the conflicts induced by multiple functions, and driving errors, the accident rate at some intersections is high. This occurs mostly along Green Street. Table 1 summarizes this experiences for 1977.

The pattern of accident types suggests the following:

1. A high proportion of turning accidents occurs west of Fourth on Green and east of Goodwin; this corresponds to the function of north-south streets where traffic interchanges with Green Street for local circulation.

2. A high proportion of rear-end collisions occurs in the Wright and Sixth Street area i.e., where capacity problems are most severe and where motorists may be more aggressive in passing through the area. In addition, there are potentials for delays associated with vehicles standing in curb lanes (trucks and drop-off) and turning vehicles.

Much of the existing street congestion is caused by a combination of factors, only one of which relates to capacity. These factors include:

-- The volume of non-university through traffic on close-in major streets.

-- Traffic recirculation (particularly drivers in search of on-street parking space).

-- Substantial modal conflicts—auto, goods delivery, pedestrian, bicycle, and bus.

-- Inadequate space for pickup (pedestrian or service) and drop-off activities.

-- Lack of signal system coordination and progression.

-- The impact of narrow roadways on space requirements for needed left-turn lanes.

Therefore, street system efficiency cannot be defined merely in terms of volume/capacity ratios. Generalized study of each modal movement and interface at intersections will be an important variable in plan potential and ultimate performance.

Parking and Service Access System

The second component, parking and service access is presented in three parts:

Parking supply.
Parking access.
Service access.

Table 1
SUMMARY OF 1977 ACCIDENT EXPERIENCE

Location	Number of Accidents	Accident Type
Green at First	31 (11P.I.)	Eleven left turn, six rear-end collisions, seven angle collisions.
Green at Fourth	28 (8 P.I.)	Seven left turn, five rear-end collisions, nine angle collisions.
Green at Lincoln	26 (6 P.I.)	Twelve left turn, four rear-end collisions.
Green at Third	24 (4 P.I.]	Seven left turn, five rear-end collisions, five angle collisions.
Green at Sixth	24 (4 P.I.)	Eleven rear-end collisions, three parked vehicle.
Green at Wright	20 (6 P.I.)	Ten rear-end collisions.
Springfield at Sixth	13 (6 P.I.)	Seven angle collisions, four right-turn collisions.
Green at Goodwin	12 (4 P.I.)	Four left-turn collisions.
Daniel at Sixth	11 (3 P.I.)	
Daniel at First	8 (2 P.I.)	

Note: P.I. means personal injury accidents.

The parking system is composed of a large number of varied facilities as illustrated in Figure 3. The majority are parking lots with a small number of parking garages. Most facilities in the study area are owned and operated by the university. There are city lots in the campus town area along Green Street.

According to previous studies,[3] the 1970 level of parking demand in the area containing university or related facilities was 12,000 spaces. In comparison, the supply was 8,900 spaces in the same area. The distribution of these spaces is shown in Figure 3. The area north of Armory has an even more acute problem with a demand for 7,300 spaces and a supply of 2,600 spaces. South of Florida Avenue, there is a considerable surplus which offsets the shortage; however, these spaces still do not meet total demand. It should be noted that even though 1970 figures are cited here, they are still representative of parking conditions. University growth has been very modest, if not stable, in recent years, and parking demand should be on the same order of magnitude.

The impact is that there is much competition or pressure for parking space. Most of the available curb space is utilized and there are many instances of encroachment by long-term parkers in patron space or illegal locations. Further, observations of the northern half of the campus area (north of Armory and, particularly, north of Green Street) indicate the use of much open land for parking lots.

What effect does the location of parking space have on parking access? Figure 3 also suggests that access to parking space locations is provided by nearly all major and secondary area streets, thereby increasing the probability of conflict between parking activity and traffic movement in a widespread manner and limiting opportunities to use public rights-of-way for other functions (transit, bicycles, pedestrians).

The provision of parking space is controlled according to two basic functional categories—long-term (rental, permit) and short-term. Unfortunately, the amount of the parking fine is low and, therefore, ineffective with respect to controlling turnover. A more forceful pricing system for parking could help alleviate some of the traffic and parking problems and provide additional revenues.

Finally, Figure 3 shows those streets system segments that are used for deliveries and goods distribution. Not shown are many of the non-university service functions, which intensify the problem. An example of this observation is the occurrence of double parking in the Green Street and Sixth Street area. The combined effect of through traffic movements, parking access, and service vehicle access substantially reduces roadway system capacity. In a university area that is characterized by relatively wide-spacing of service distribution points, the lack of a system of service "spines" or cores that minimize the number of service areas, increases use of the street system unnecessarily. Furthermore, deliveries and service to buildings with access along or crossing major pedestrianways and roadways are not prohibited during peak times. For example, prohibitions might be applied between 9:30 A.M. and 2:15 P.M., as is the case in many other dispersed delivery environments, to relieve the peak-hour pressure on vital street segments.

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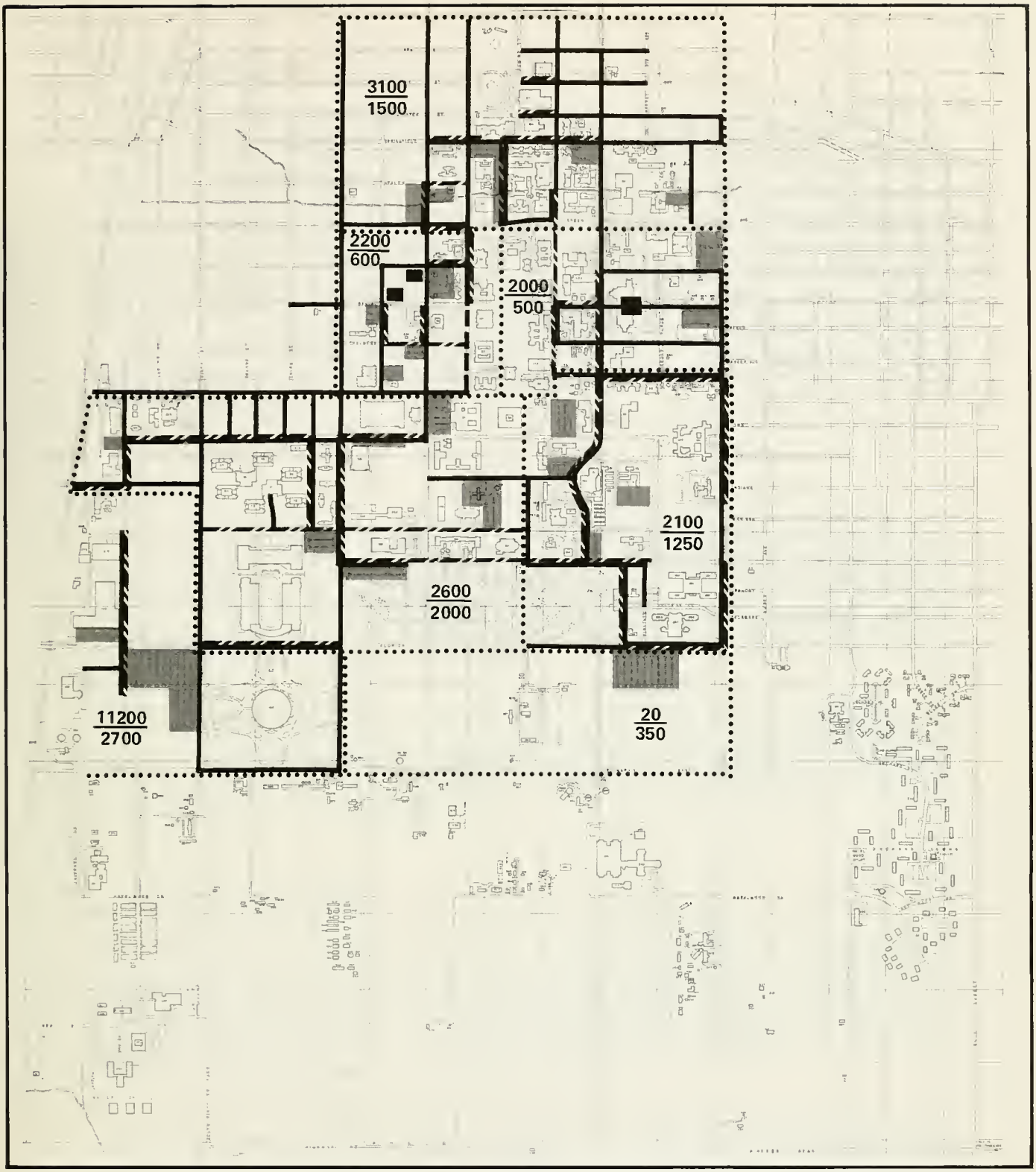
[3] See Bibliography; also see Appendix for a current estimate of parking needs, as prepared by the University's Parking Office in 1978.



UNIVERSITY AREA TRANSPORTATION PLAN

- ON-STREET OR OFF-STREET PARKING ACCESS
- SERVICE ACCESS TO UNIVERSITY BUILDING/FUNCTIONS
- EXISTING PARKING GARAGES
- MAJOR PARKING LOTS

(1970 UNIVERSITY PARKING STUDY)

- 000 / 000 PARKING DEMAND BY DISTRICT / PARKING AVAILABILITY
- ..... PLANNING DISTRICT BOUNDARIES

Figure 3
EXISTING PARKING FACILITIES

Transit System

The Champaign-Urbana Mass Transit District provides excellent and rather frequent service from most parts of the region to the university area. All but one line (Grey) (see Figure 4) links with the campus and provides for easy transferring within a relatively short time. While traffic delays have not seriously hampered system performance, conflicts with other vehicular and service traffic creates concern about continued reliability and safety. Transit patronage would undoubtedly benefit if routes and stops were located nearer to the campus proper, clear of traffic (and pedestrian) congestion. Unfortunately, transit does not serve the movement between major parking facilities and trip designations as it might if a parking policy specifically supported the concept. Finally, the clarity of the system suffers to some extent from the separation of routes in opposite directions due to one-way streets.

Bikeway System

The most recent bikeway system plan[4] for the study area is shown in Figure 5. The route system contains some apparent redundancies (where routes are spaced closely together), as well as some loose or unconnected route end points (not necessarily termination points). The major concern with some of the other proposed segments are the safety issues resulting from conflicts with major traffic arteries, such as on Sixth Street.

Most existing pavement widths prohibit the use of bicycle lane striping, and mixing bicycle traffic with automobile and truck traffic can create major safety as well as capacity problems. Bikeway routes are necessarily an important component of the total transportation system and, as such, require careful placement and access consideration.

Pedestrianway System

Pedestrianways are the most ubiquitous element in the total transportation system. There are major auto-free zones in which pedestrian movements take place without conflict, except that caused by bicycles. For purposes of this study, the area of concern is the transition zone around the campus core where pedestrian flow intersects with other modes. Figure 5 indicates the general locations of these pedestrian movement corridors.

Green Street, the Wright and Sixth Street corridor, Goodwin and Pennsylvania are the locations considered in plan development. Wright Street and Green Street probably have the greatest concentrations of pedestrians at certain times of the day. Along these streets, pedestrian movements seem to be somewhat

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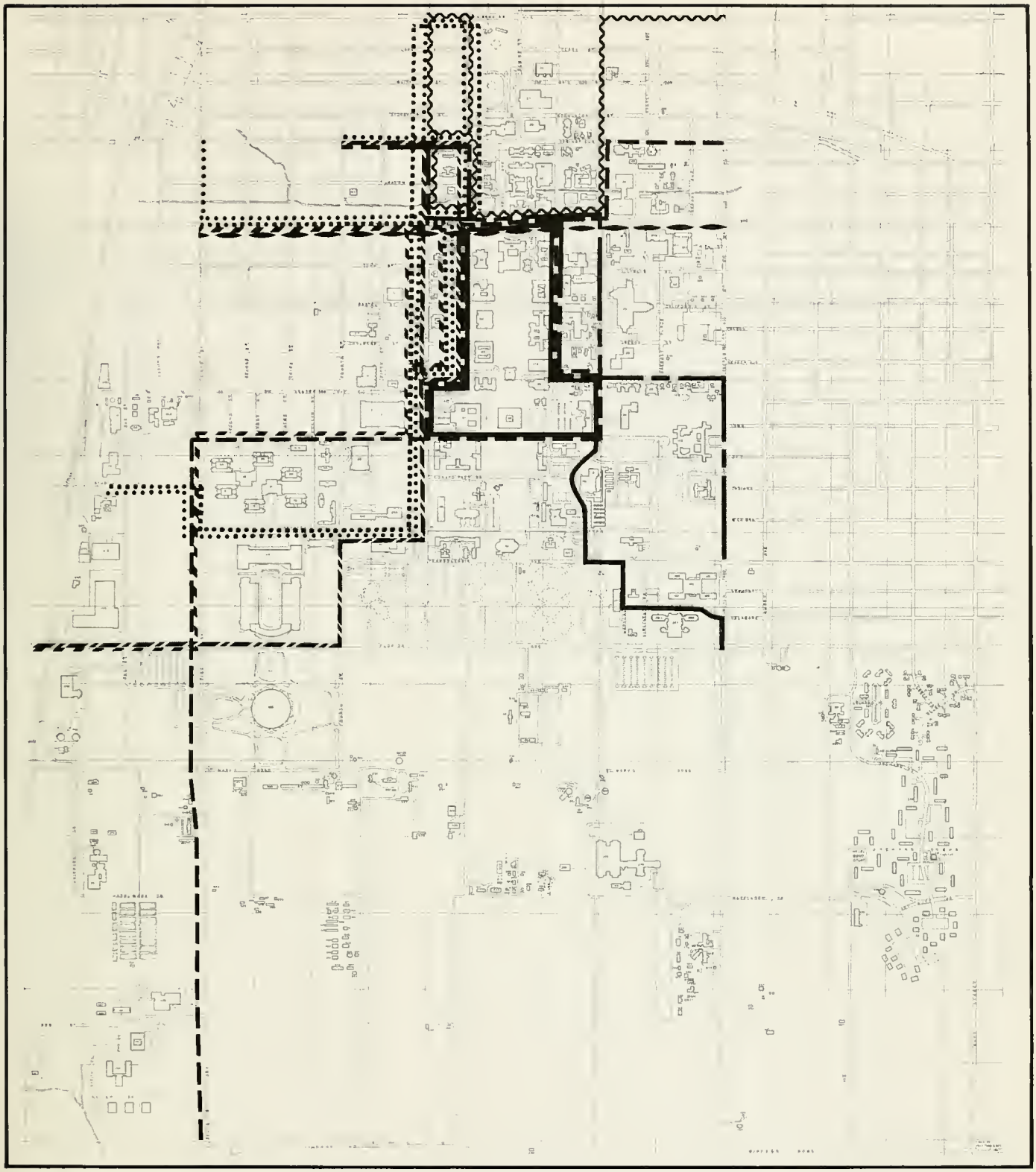
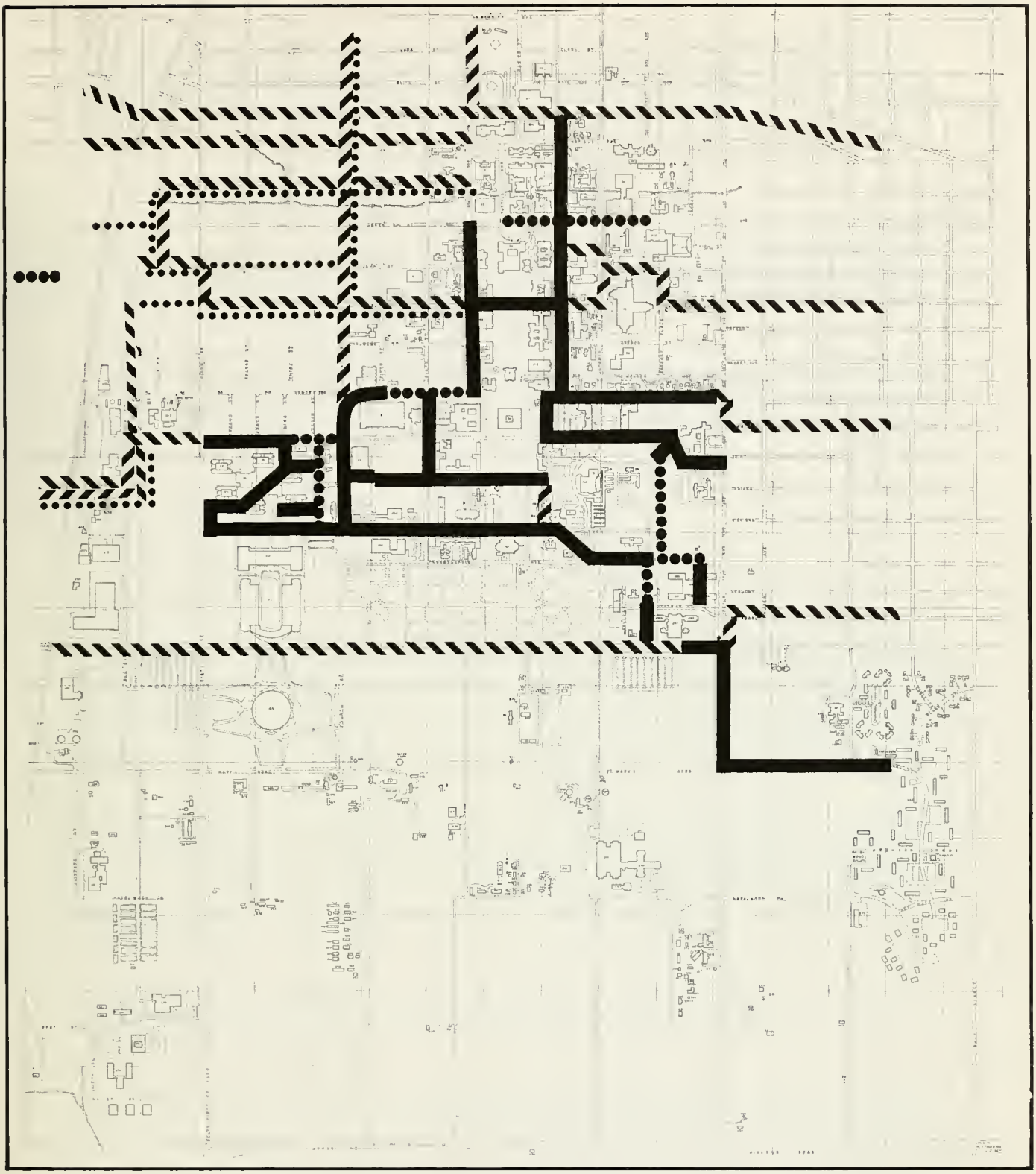
[4] This includes information indicating other plan proposals which differed from the CUUATS concept.



UNIVERSITY AREA TRANSPORTATION PLAN

- YELLOW LINE
- RED LINE
- LAVENDER LINE
- BLUE LINE
- GREEN LINE
- ORANGE LINE
- ORCHARD DOWNS
- BROWN LINE
- GOLD LINE

Figure 4
EXISTING TRANSIT ROUTES



UNIVERSITY AREA TRANSPORTATION PLAN

CLASS I

CLASS II

CLASS III

OTHER PROPOSED BIKEWAYS (CITY OF CHAMPAIGN)

CLASS III

SOURCE: CUATS BIKE PLAN (1977)
CITY OF CHAMPAIGN BIKE PLAN

EXISTING AND PLANNED BIKEWAYS (AND PEDESTRIANWAYS)

Figure 5

uncontrolled or random in location and direction. Conflict between crosswalk movements and turning vehicular traffic is significant at Wright and Green and Sixth and Green. Safety hazards are very apparent; however, to date, accident statistics have not indicated that such a problem actually occurs.

Historical Transportation Plans and Proposals

Given the characteristics of the existing systems, this section examines the range of proposals and recommendations that have been considered in response to the observed deficiencies and problems. The text of this section will provide the context in which to identify problems and issues.

Beyond proposals to widen various roadways, which are in all of the long-range plans, relatively few recommendations have surfaced for improving transportation in the university area. These recommendations can be segregated into five major categories:

- One-way couple systems.
- Intersection and signal system improvements.
- Street closures or restricted street use.
- New construction.
- Parking policy.

Roadway widenings are not significant aspects of these proposals, apparently because of the restricted rights-of-way available on most facilities and the speculative nature of the growth and developmental assumptions surrounding the specific long-range forecasts. Suffice it to say that widening was proposed for nearly all of the major arterial roadways in at least one of the recommended plans.

The range of one-way couple options exhibited the widest variation in concept, with none apparently providing the "best" option. In the north-south direction all but Second Street (in the First to Wright corridor) were included in at least one concept. For the east-west direction, proposals usually consisted of either a Springfield/Green or a John/Green couple; in one instance, a Green/Illinois couple was proposed.

In the area of parking policy, peak-hour parking restrictions have been suggested for University, Lincoln, Florida, and First/Fourth Streets in an effort to increase traffic capacity.

In each of the recent plans and proposals the absence of a total multimodal system approach is evident. While a majority of the planning studies have included general statements of goals and objectives, concrete planning principles that can specifically guide the planning process are needed. For example, it is not clear why the Springfield/Green one-way couple does not extend beyond Fifth Street, particularly when major traffic arteries should be continuous, avoiding where possible, unnecessary turning movements.

Problems and Issues

In general, the focus on transportation problems seems to be at the project rather than the system level. Stated another way, the emphasis may more likely be placed on the symptoms rather than searching for basic causes. For example, some of the observed symptoms on record include:

- The congestion, turning, and weaving movements on Green between Sixth and Wright Streets.

- Double parking of service and delivery vehicles.

- Traffic increases on John Street.

- "Dead-end" local access streets.

In the consultant's judgment, the key *causes* of circulation and safety problems in the university area stem from the lack of a parking policy and concept integrated with approach routes and the location of pedestrianways; the designation of a priority function for each road segment (flow, circulation, access, transit, bicycle, and pedestrian); and the low priority associated with capital investments needed to implement special-design facilities (transit, bicycle, or pedestrian streets). The location and use of parking space can control to a substantial degree the ultimate origins and destinations of traffic. As a result, parking policy and regulation virtually dictate the function of surrounding roadways. Even to a greater degree, however, the issue of a *multimodal* approach to accommodating university travel demand has a far-reaching impact on street utilization and role. It is specifically when the street function is not clearly defined that the following conflicts result:

- Roadways functioning as both arterials and collectors.

- Bikeways and service distribution areas existing on the major traffic arteries.

- Uncontrolled joint use of pedestrianways, bikeways, and bus loading areas.

- Pavement use (storage, traffic movement, bicycle lane, bus).

Barriers to Problem Solving

The solution of transportation problems involves considerably more than workable technical designs. A difficulty that typically arises is the inability to attain a unified solution for an area within the jurisdiction of more than one public entity. Simply agreeing upon project priorities can be difficult.

Other "barriers" arise out of the varying financial capabilities of the participating agencies. A primary example in this case is the University of Illinois' legislative restriction which allows the expenditure of funds only for university-owned property. Shortages of funds in general have forced planning emphasis on transportation system management (TSM) and routine maintenance operations and left major capital improvements in serious doubt. An example of this problem is obvious in the feasibility study of the Windsor Road corridor. That study stated that FAU funding provides approximately $452,000 per year which is already fully programmed for the next seven years, leaving no excess funds for this type of major investment.

Social and environmental issues present non-transportation "barriers" that cannot be ignored in the consideration of alternatives. Neighborhood character and boundaries are extremely evident in the university area. For example, land-use planning studies by the Regional Planning Commission, Cities of Champaign and Urbana, for areas to the northeast, north, and west of the campus have dealt with these issues. The "Boneyard" studies suggest alternative goals for land-use and environmental quality along the creek. These neighborhood areas historically have been sensitive to issues of traffic intrusion and street widening. Finally, the community unification issue could have an effect on the viability of some of the more controversial options (i.e., the role of Green Street).

Recap of Issues

Without attempting to duplicate the previous discussions, the key issues identified could be summarized as follows:

1. Lack of a parking policy or concept for the university with which other transportation system planning can be coordinated.

2. Apparent inability of local agencies and groups to decide on a street circulation and access system for the study area, particularly as it relates to the campus town area.

3. Lack of the circulation system tends to confuse the function of various streets, this leads to multiple uses of the streets with inherent conflicts, inefficient operations, and chronic land-use access problems.

4. A high-accident rate at some locations, particularly along Green Street.

5. Minimum potential for increasing street capacity due to right-of-way or environmental constraints.

6. Land-use boundary problems involving concerns about penetration by nonlocal traffic.

7. Significant financial constraints for transportation improvements including limitations on cost-sharing between participating agencies.

8. Lack of a uniform position concerning the role of mass transit in serving university-generated travel demand.

In citing the above, it is recognized that there are a number of existing site-specific transportation problems. These may be difficult to solve for various reasons, but in the absence of systematic or framework agreements, such solutions are more difficult or even worse, inappropriate solutions could be undertaken. *The essential need is to develop transportation systems that participants will support, then address the individual problems as funds and other contraints allow.*

Planning Objectives

In order to begin developing answers, the problems and issues need to be converted to more positive considerations via the articulation of a set of transportation program objectives. These are "end-state" conditions which would be achieved by the program. They are preliminary at this point, since some may prove to be impossible or too costly to implement.

The objectives are categorized into two groups:

1. System objectives—describe overall conditions or the principles to be utilized.

2. Site specific—describe certain specific performances or designs to be employed for the study area.

These lists do not reflect any order of priority at this time. Such values should become apparent at a later date.

System Objectives

1. Because of the complex nature of the study area and its high level of activity, the transportation plan and program should be unified by considering it as a "single project" for which each major agency should commit resources in a joint effort.

2. Employ the principle of a "functional hierarchy" to identify design and operations priority for streets to reduce "multiple loading" conditions and inherent inefficiencies.

3. Recognize the following street functions as appropriate to the study area:

   a. Major through streets.
   b. University area collector-distributor streets.
   c. Land-use access streets.
   d. Special vehicle streets (transit and bicycle).
   e. Service drives (goods, maintenance, emergency).

4. Increase the attractiveness of transit for travel to the campus area by improving bus trip time and minimizing passenger walking distances to bus stops.

5. Employ an overall transportation pricing policy that equates service or benefits more equitably with facility and operating costs.

6. Improve the clarity of access to the university from regional highways and the regional major street system.

7. Plan or design a "self-enforcing" or clearly defined local access system in order to minimize encroachment onto "auto limited" zones and assure that travel by auto is convenient with minimum driver confusion.

8. Improve traffic flow efficiency on study area streets by creating a more consistent (with designated street function) traffic control system (signs and signals), including traffic signal operations employing network principles.

9. Reduce the amount of public right-of-way devoted to auto use in order to support:

   a. Land-use district consolidation.

   b. Enhancement of environmental quality (air, noise, more space for natural elements, visual appearances).

   c. Provision of more space for pedestrian use.

Site-Specific Objectives

1. Reduce potentials for left-turn and rear-end collision accidents along Green Street at First, Fourth, Sixth, Wright, and Lincoln.

2. Reduce accident potential due to conflicts between bus passenger on/off movements and bicycle traffic along Wright, Green, and Mathews.

3. Provide more off-street parking space for short-term demand as convenient replacement for curb parking space in the campus town and Gregory Place areas.

4. Provide more (via conversion) errand parking space (i.e., 15 minutes or less) in proximity to land-uses generating significant volumes of such activity (e.g., student services building, bookstore, drugstore).

5. Stabilize the quantity of university parking space by increasing the usefulness of university-owned fringe or satellite parking areas via transit access and control of close-in space.

6. Consolidate small parking areas in order to improve lot efficiency and reduce the number of parking lot driveways (which in turn reduces the number of conflict points and increases the opportunity to change street function to more desirable uses).

7. Reduce negative university-generated traffic impacts in the residential neighborhoods located:

   a. Along and east of Lincoln Avenue.
   b. In the First Street to Wright Street corridor north of Springfield Avenue.

8. Minimize the amount of non-university related traffic using Green Street, First, Fourth, Sixth, and Goodwin Avenue.

9. Strengthen the role of Lincoln Avenue as a major through street.

10. Increase the usefulness of Stadium Drive as a campus access street from areas to the west.

11. Maintain flexibility in the major through street system so that Florida Avenue and First and Fourth Streets can be restricted or temporarily closed to accommodate special events at the stadium or assembly hall.

12. Accommodate future peak-hour traffic demand at Level of Service D at intersections involving major through streets and/or university area collector-distributor streets and for the network of major campus access streets.

13. Provide better bikeway access for areas west of the campus in the John Street corridor.

14. Provide better space for bus stops (vehicle operations, passenger space, and facilities).

15. Provide improved truck loading areas (particularly to eliminate double parking conflicts and blockage of traffic lanes in the campus town area).

16. Manage the use of curb parking space and the placement of traffic signs and other posts or poles to avoid sight distance restrictions or blockage of desirable pedestrian paths.

3.
ALTERNATIVE TRANSPORTATION CONCEPTS

Using the results of the background studies and the preliminary objectives, a set of alternative transportation concepts were developed. The concepts evolved from first considering the wide range of likely components to the packaging of these components into a set of more specific alternatives.

Planning Approach

In addressing the problems and needs for improvements in the overall transportation system for the study, two factors should be considered:

1. A basic thrust of the preliminary objectives is to improve the environment for bicycle and pedestrian movement as well as the quality of the environment for the variety of activities taking place.

2. Opportunities to achieve Item 1 are tied to reasonably satisfying the need for auto circulation (and access) and parking demand (both university-generated and business patron parking).

Therefore, the organization of the alternatives follows two themes, i.e., parking and circulation concepts. By solving the need for these two elements of the overall system, workable opportunities to improve the pedestrian and bicycle environment, i.e., safety and amount of space can be determined.

Even though concepts are developed with a single mode emphasis, the intent is to join them into one system. Reviewing them separately, however, provides a better chance to understand the more particular issues associated with each modal element.

Using this organization, the specific design of alternatives utilized the results of the other technical activities. These results were used simultaneously as a source for ideas about what could or should alternatives contain. One of these idea-producing activities was a listing of planning principles. These are not to be confused as objectives, they are the tools or means by which alternatives could achieve the objectives. Overall, these principles define desirable attributes for a plan, i.e.:

- Use a functional hierarchy.
- Minimize conflicts between modes.
- Separate non-compatible movements.
- Support land-use (activity location and boundary).

These are further extended into general ideas about parking and circulation.

Parking Concepts

1. Consolidate small units, aggregate access drives.

2. Convert certain "close-in" parking lots to other uses and replace with:

   - Available satellite space.
   - New parking garages.

3. Eliminate staff/employee parking or student parking; provide only limited visitor spaces.

4. Controlled locations to reduce traffic pressure on Green Street and to reduce pedestrian/bicycle conflicts at campus core boundary, i.e.:

   - Facility sites along Florida corridor.
   - Facility sites along Springfield corridor.

Circulation Concepts

1. Create "breathing space" around core.
2. Super block development modules and boundary streets.
3. Recognize functional hierarchy.
4. Relate to Boneyard and Food for Century III.
   - Expand pedestrian core to north of Green.
5. Expand auto restricted zone (ARZ) principle.
6. Create shopping center circulation concept with loop roads.

The second technical idea-generating activity was describing "responses" to the objectives. In this case, ideas about the physical or operational meaning of the objective was identified. This was an exercise to develop the widest range of possible improvements or actions. From this agenda, specific ideas were extracted to form the alternatives. These responses are listed in the following. For the sake of brevity, a cryptic or key word approach is used.

System Objectives

1. *Unified Project*
   a. New boundaries.
   b. Agency commitment.
   c. Ongoing organization (with authority).
2. *Priority Treatment*
   a. Explicit functions versus no differentiation.
   b. Design standards.
   c. Financial priorities.
   d. Commitment to coordination.
   e. Multimodal approach (TSM).
3. *Hierarchy*
   a. Compatibility in planning process.
   b. Impact of "word choice" (i.e., connotations of certain terms—arterial versus through street).
   c. Level of detail.
4. *Transit Role*
   a. Preferential treatment—lane space, signal control, and separation.
   b. Control of parking supply.
   c. Increase parking fees.
   d. Two-way transit routes.
   e. Use of special campus shuttle.

5. *Pricing*

   a. High cost of curb parking to reflect high value of street space (for alternative uses).

   b. High per hour cost of short-term personnel parking.

   c. Free fringe parking.

   d. Higher parking fines.

6. *Clarity of Access*

   a. Consistent trail blazers (location, scope, and style).

   b. Use of "corner access" concept (i.e., approach routes direct traffic to corner of area rather than midpoint so that traffic flows around not through).

   c. Role of Windsor Road.

7. *Self Enforcing*

   a. Balanced circulation (e.g., one-way pairs not one-way singles).

   b. Use of barriers, block sight distances.

   c. Design standards to match role.

   d. Use "complete" grid.

8. *Traffic Control Strategy*

   a. No stop signs for major through streets.

   b. Comprehensive signal progression across political boundaries.

   c. Warranted use of stop signs to reflect collector streets.

9. *Street Right-of-Way*

   a. Super block development concept.

   b. Consolidate auto access needs.

   c. Intercept autos at edges.

   d. Reduce high volume of recirculating traffic in campus town.

Site Specific

1. *Green Street Accidents*

   a. Left-turn lanes.

   b. Use of one-way streets.

   c. Reliable control-traffic lane use (no blockages).

   d. Eliminate turns at Sixth, Wright from Green Street.

   e. Eliminate progression completely on Green Street.

2. *Bus/Bicycle Accidents*

   a. Wider bus stop zones.

   b. Relocate bikeways.

   c. Physical barriers.

3. *Short-Term Parking*

   a. Consolidation to gain efficiency.

   b. More lots.

   c. Restrict employee use of existing off-street, provide employee parking elsewhere.

4. *Errand Parking*

   a. Resigning.

   b. Improved enforcement (personnel commitment) with a financial or fee schedule plan.

   c. Convert streets to linear parking area with angle parking.

   d. Construct parking bays on local streets.

5. *Fringe Parking*

   a. Transit shuttle service.

   b. More parking along First Street.

   c. Provide amenities for shuttle transit.

   d. Preferential parking for car pools.

6. *Consolidate Space*

    a. Supply balanced with access capacity.

    b. Eliminate significant sidewalk conflicts at driveways.

7. *Neighborhood Impacts*

    a. Eliminate through paths—physical barriers.

    b. Capacity increases on nonlocal streets.

    c. Signal control.

    d. Turning restrictions.

8. *Role of Streets*

    a. Develop bypass routes.

    b. Signal control.

    c. Expand capacity of through streets.

    d. Interrupt continuity.

9. *Lincoln Avenue*

    a. Signal progression.

    b. Throat widening for left turns.

    c. Connections to Windsor Road.

10. *Stadium Drive*

    a. Eliminate jog at Neil Street.

    b. Eliminate jog for Peabody.

    c. New parking supply directly accessible from Stadium Drive or along First Street.

11. *System Flexibility*

    a. Strengthen system interconnections.

    b. Add through street links for circulation around university.

    c. Use of grid system configurations.

12. *Capacity*

    a. Signal plan adjustments.

    b. Narrower lanes.

    c. Limited throat widening.

13. *Bikeway Access on John Street*

    a. Change role of Green Street.

    b. Eliminate continuity of John Street.

    c. Eliminate curb parking.

    d. New underpass for John Street.

14. *Bus Stop Space*

    a. Functional reuse.

    b. Right-of-way acquisition.

    c. Reposition stops to take advantage of building setback.

15. *Truck Loading*

    a. Develop service courts.

    b. Service "hours."

    c. Convert more curb space to service use.

    d. Super block development planning.

    e. Street closures.

16. *Sight Distance*

    a. Use of sidewalk extensions.

    b. Street functional change.

Specific Alternatives

Using this appproach, the design of specific alternatives recognized the organization of land-use activities. The significant areas are:

1. The central core of the campus.
2. Campus north of Green Street.
3. South campus including "Food for Century III" development area.
4. Campus town commercial area.
5. Mixed institutional area west of campus in Wright-Sixth-Fourth Street corridors.
6. Athletic stadia area.
7. Campus area south of Florida Avenue.
8. Various university housing areas.
9. Residential neighborhood west of Fourth Street.
10. Residential area generally at northeast corner of the campus.
11. Residential area generally at northwest corner of the campus.
12. Residential neighborhood east of Lincoln Avenue.

The boundaries defining these areas become important for locating transportation facilities. They help identify paths for through streets, areas to be served by local collector streets, areas for specific access, and how parking supply would need to be generally arranged. With these important land-use relationships in mind, the parking and circulation alternatives illustrated in Figures 6 through 13 were prepared.

Parking

Three concepts are depicted, ranging from limited change to a potentially major capital intensive program. The concepts reflect management of the motorist, i.e., (1) some limited change via rearrangement to on-campus or close-in parking supply to achieve certain efficiencies and reduce conflicts; (2) increased impact by relocating parkers to new facilities with some decrease in convenience in order to achieve other objectives; and (3) maximum impact on parking convenience and tight control over parking improvements in or adjacent to campus core, would likely involve substantial upward adjustment in parking fees to create incentive to use fringe parking.

Specific attributes are:

Alternative A: Parking Lot Consolidation (Figure 6)

a. Consolidates smaller lots to reduce the number of driveways (and conflict points).

b. Creates opportunities to use some streets for other than access purposes.

c. Actions devoted to various areas around edge of concentrated activity zones.

d. By creating larger units of parking, provide opportunity to apply management techniques and increase turnover of space, thereby offering more parking permits for sale and absorbing some of the existing backlog of permit applications.

Alternative B: Parking Lot Replacement (Figure 7)

a. Releases land for other (possibly more important) uses including other transportation modes; this could help achieve the building development and environmental quality objectives for the campus.

b. Attempts to preserve reasonable walking distances, although the average walking distance would increase over the existing situation.

c. Locates new concentrations of parking in accessible locations around the campus and thereby causes relocation of auto traffic for inner sections of the campus.

d. Replaces parking space with modest increase in total supply.

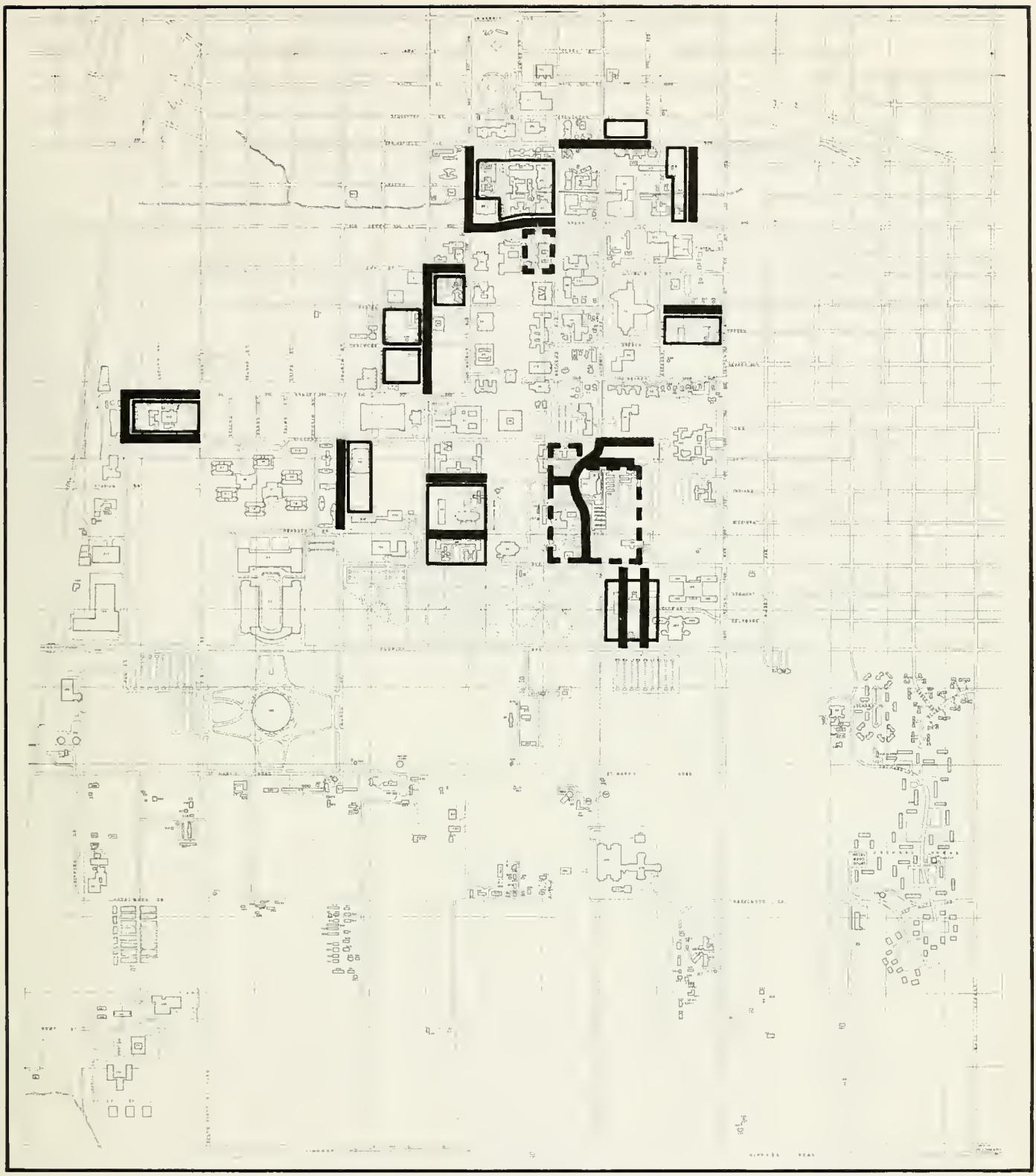
Alternative C: Satellite Parking Space (Figure 8)

a. Attempts to make more use of available satellite parking space (along Florida Avenue) in order to reduce parking traffic in areas generally north of Pennsylvania Avenue.

b. Represents a lower-cost (capital cost) solution as compared to Alternative B.

c. Requires balanced approach relative to parking fee schedules, level of transit service, and control/availability of close-in parking space.

d. Represents a means to control and reduce the supply of parking space which can be used to achieve land-use or environmental objectives.



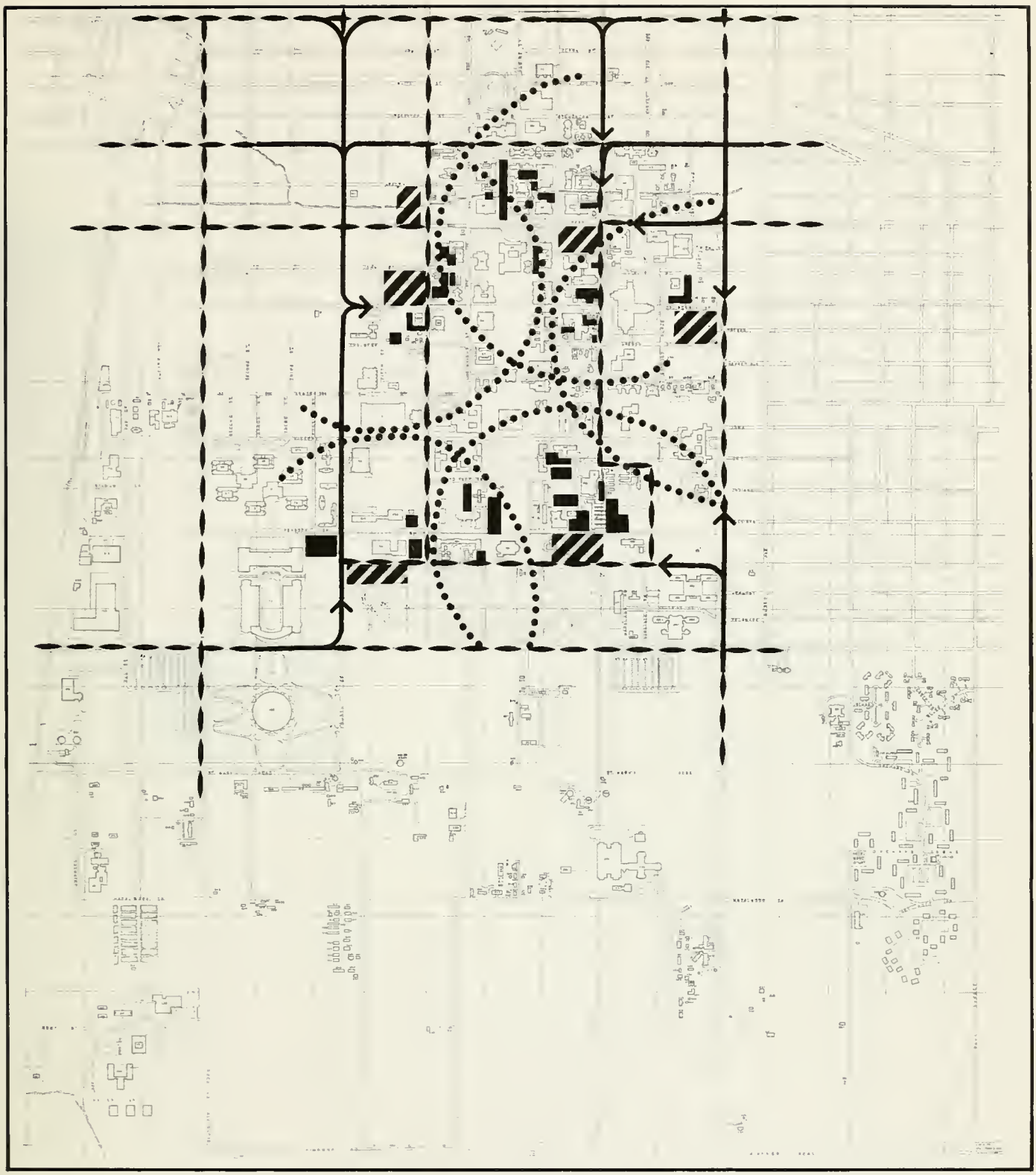
UNIVERSITY AREA TRANSPORTATION PLAN

EXISTING LOT AREAS FOR CONSOLIDATION

OPERATIONS ON THESE STREETS
IMPROVED VIA ACCESS CHANGES

Figure 6

ALTERNATIVE PARKING CONCEPT A



UNIVERSITY AREA TRANSPORTATION PLAN

NEW PARKING FACILITY (STRUCTURE)

EXISTING LOT CONVERTED TO OTHER USE

¼ MILE WALKING DISTANCE FROM NEW FACILITY

Figure 7

ALTERNATIVE PARKING CONCEPT B

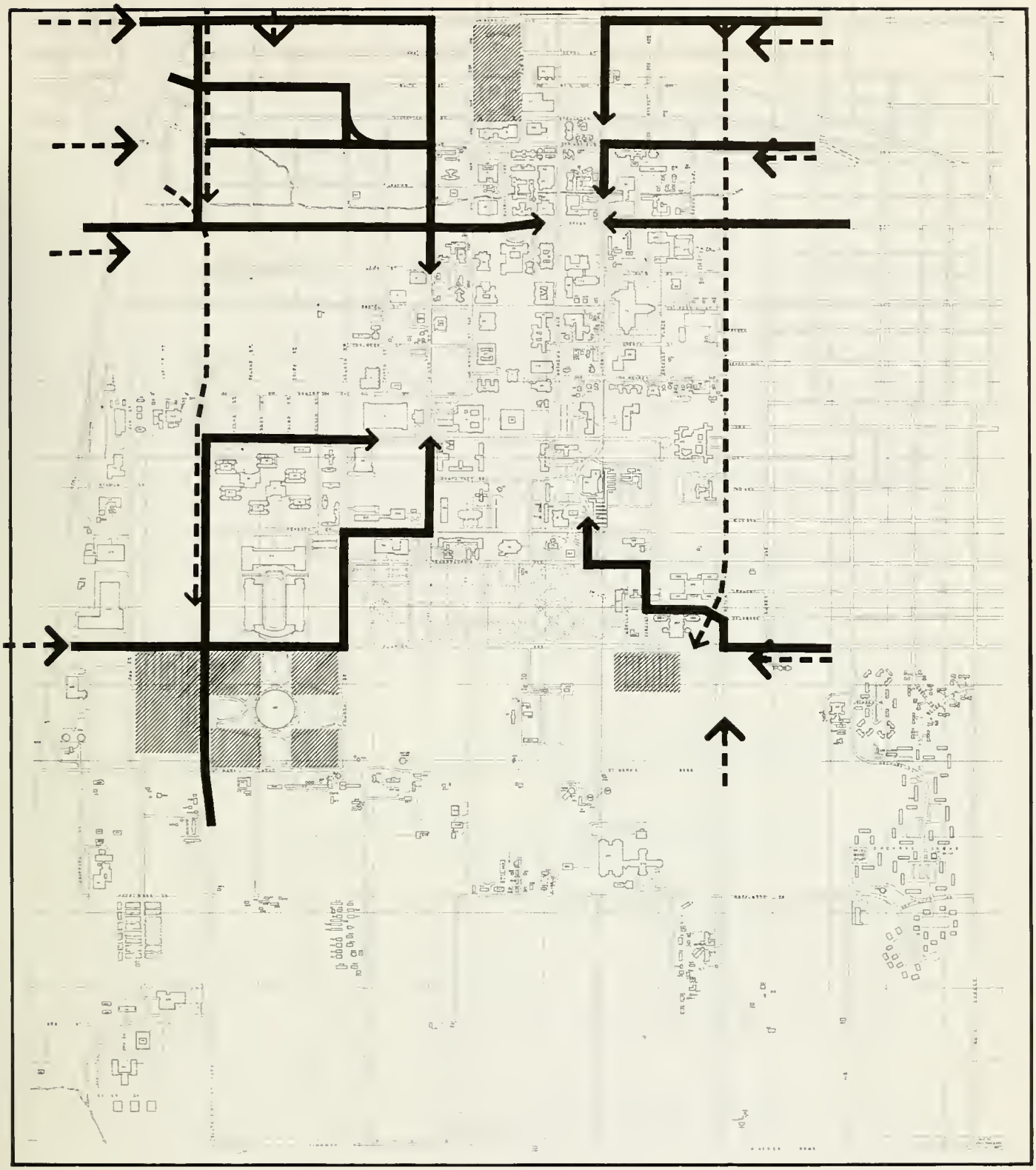


Figure 8

ALTERNATIVE PARKING CONCEPT C

Circulation

Five concepts have been developed. These provide different ways to deal with east-west non-study area traffic volume and the Green Street function issue, the use of one-way versus two-way circulation systems, and means to minimize traffic penetration potentials achieving greater functional separation.

Specific attributes of these alternatives are:

Alternative A (Figure 9)

a. Creates additional space between through streets and edge of campus.

b. Creates more local role for Green Street by developing special use sections east of Sixth Street.

c. Provides access to the Union (as campus "front door") via connection of Green and Wright utilizing special street design.

d. Includes the possibility of Windsor Road functioning as an alternative major east-west street.

e. Provides Stadium Drive connection to east-west collector streets.

Alternative B (Figure 10)

a. Attempts to provide more traffic capacity along north and east edges of the campus using one-way couples.

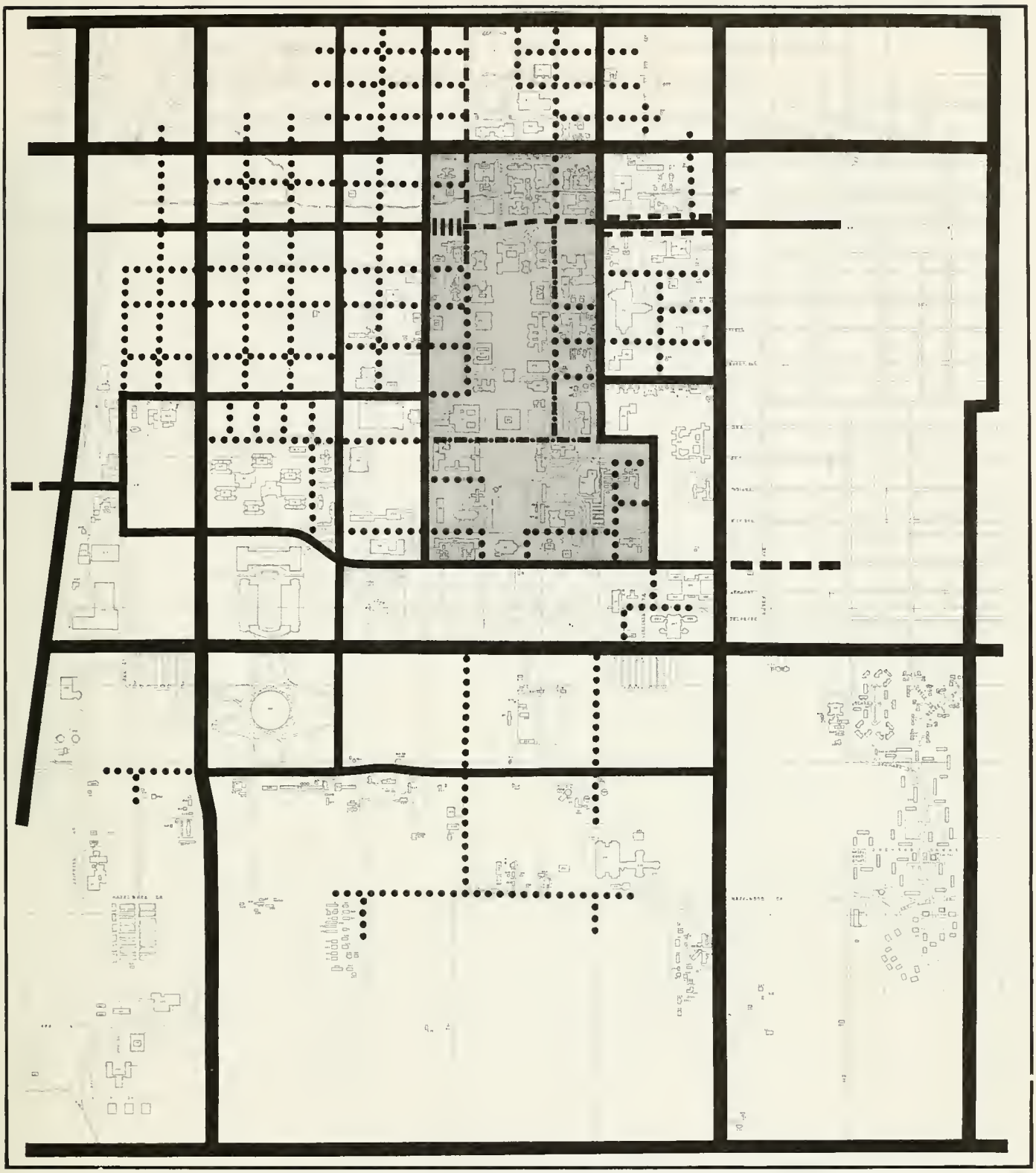
b. Green/Springfield shown as one-way pair providing major through street service (requires transitions to and from Green Street).

c. Uses Fourth/Sixth as one-way pair providing collector-distributor service.

d. Windsor Avenue shown as connecting link to either First Avenue or Florida Avenue for access into university area.

e. Uses one-way operations to create local circulation patterns, including short segments of Wright and Mathews.

f. Creates useful around-the-block circulation patterns, including encouraging circulation in campus town around blocks north of Green Street.



UNIVERSITY AREA TRANSPORTATION PLAN

MAJOR THROUGH STREET

COLLECTOR-DISTRIBUTOR

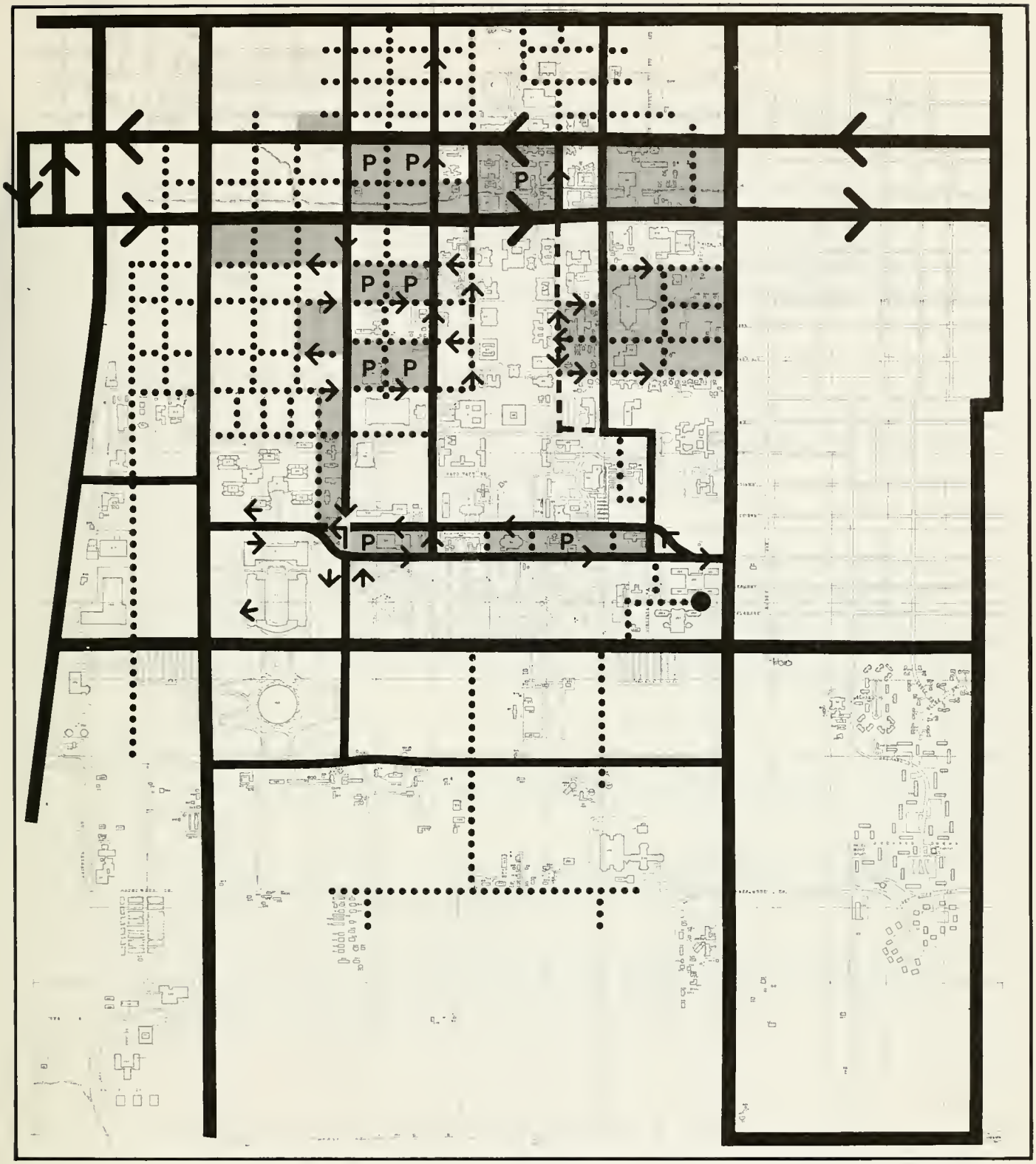
LAND ACCESS

SPECIAL-USE STREET (BUS/BIKE)

PEDESTRIAN-ORIENTED AREA (MALL)

Figure 9

ALTERNATIVE CIRCULATION CONCEPT A



UNIVERSITY AREA TRANSPORTATION PLAN

MAJOR THROUGH STREET

COLLECTOR-DISTRIBUTOR

LAND ACCESS

SPECIAL-USE STREET

BLOCKS WITH COMPLETE CIRCULATION

P MAJOR PARKING CONCENTRATION

Figure 10

ALTERNATIVE CIRCULATION CONCEPT B

Alternative C (Figure 11)

a. Uses an alternating one-way street system comprehensively throughout study area.

b. Provides block circulation patterns consistent with land-use.

c. Allows auto presence to be ubiquitous, possibly at expense of pedestrian.

d. Improves capacity, diminishes left-turn problems, and is attainable within existing rights-of-way.

Alternative D (Figure 12)

a. Configured in pattern similar to that used for major activity centers, i.e., ring road with loop penetrators for access and local circulation.

b. Relates more closely to land-use boundaries.

c. Includes local role for Green Street. For this purpose, curb parking could be allowed along both sides of the street; this could be augmented by landscaping and the creation of "parking or loading bays" by modifying the curb location.

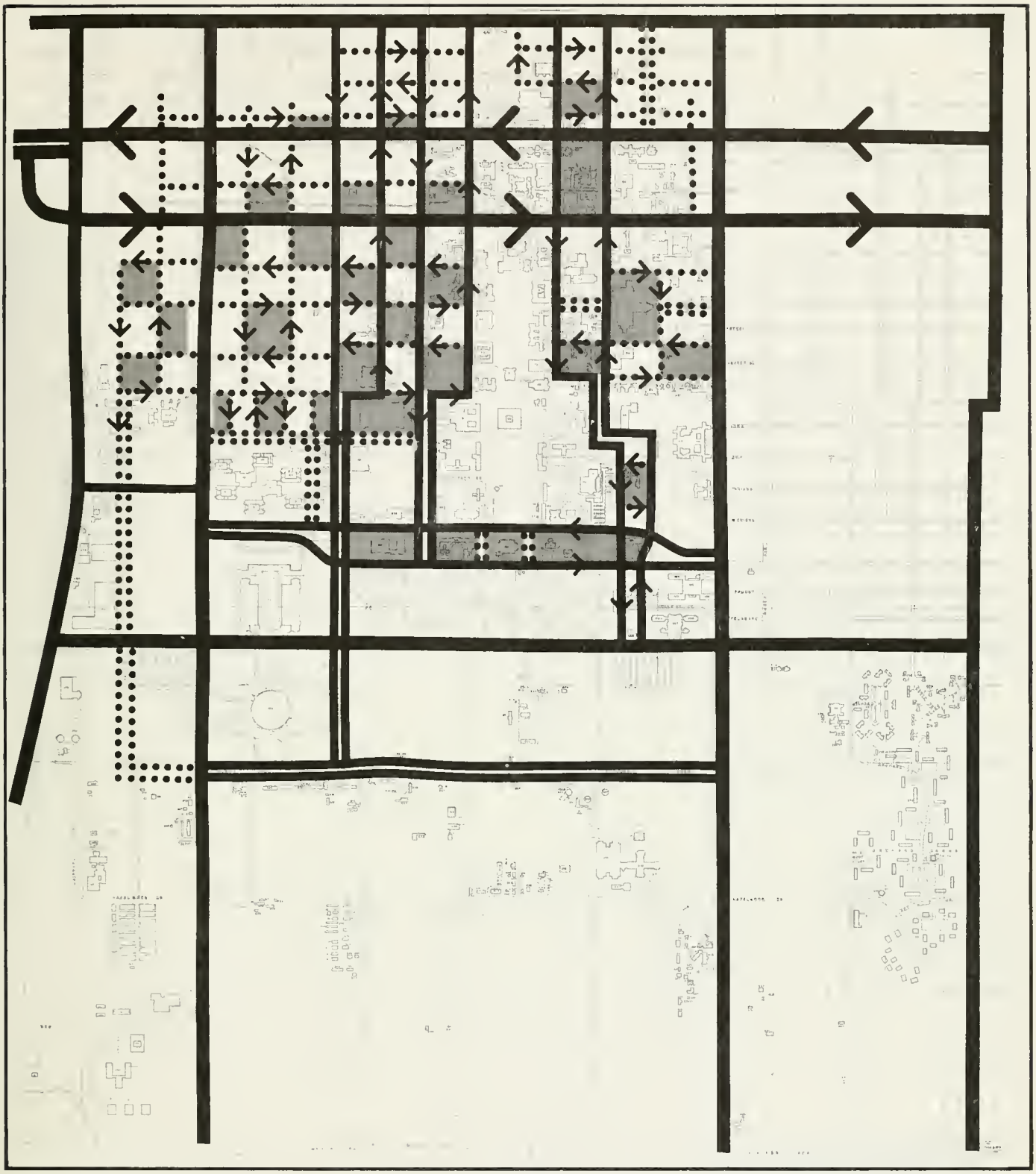
d. Reflects potential street closures envisioned in Boneyard studies.

Alternative E (Figure 13)

a. This generally reflects the existing street system relative to through street and collector street functions.

b. A "controlled local role" would be envisioned for Wright Street; local access loops would be available around the commercial blocks and those institutional blocks where access would be needed.

c. A special use function would be designated for most of Mathews Avenue. This would provide better pedestrian linkages for academic areas east of Mathews to the existing campus core.



UNIVERSITY AREA TRANSPORTATION PLAN

MAJOR THROUGH STREET

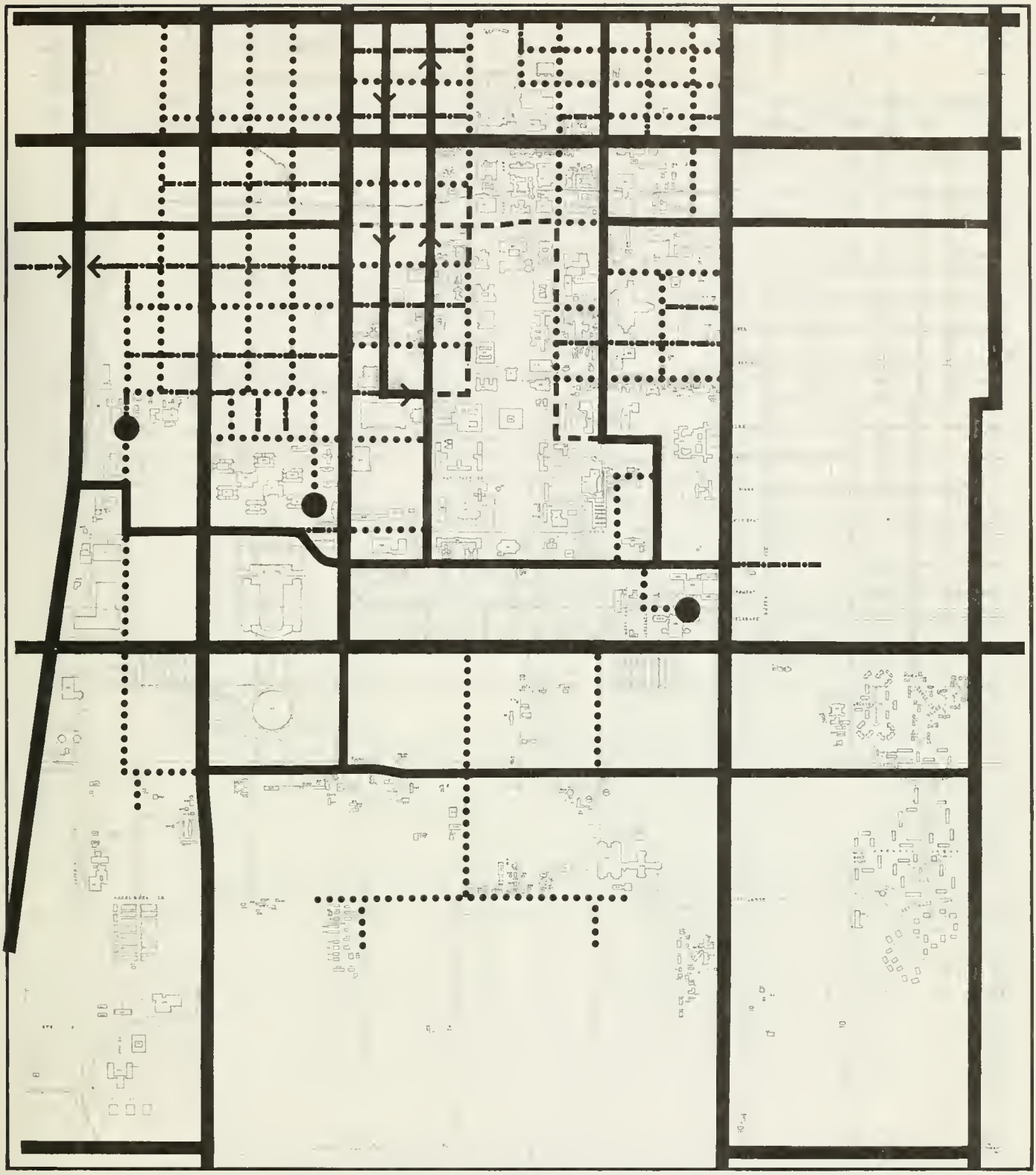
COLLECTOR-DISTRIBUTOR

LAND ACCESS

BLOCKS WITH COMPLETE CIRCULATION

Figure 11

ALTERNATIVE CIRCULATION CONCEPT C

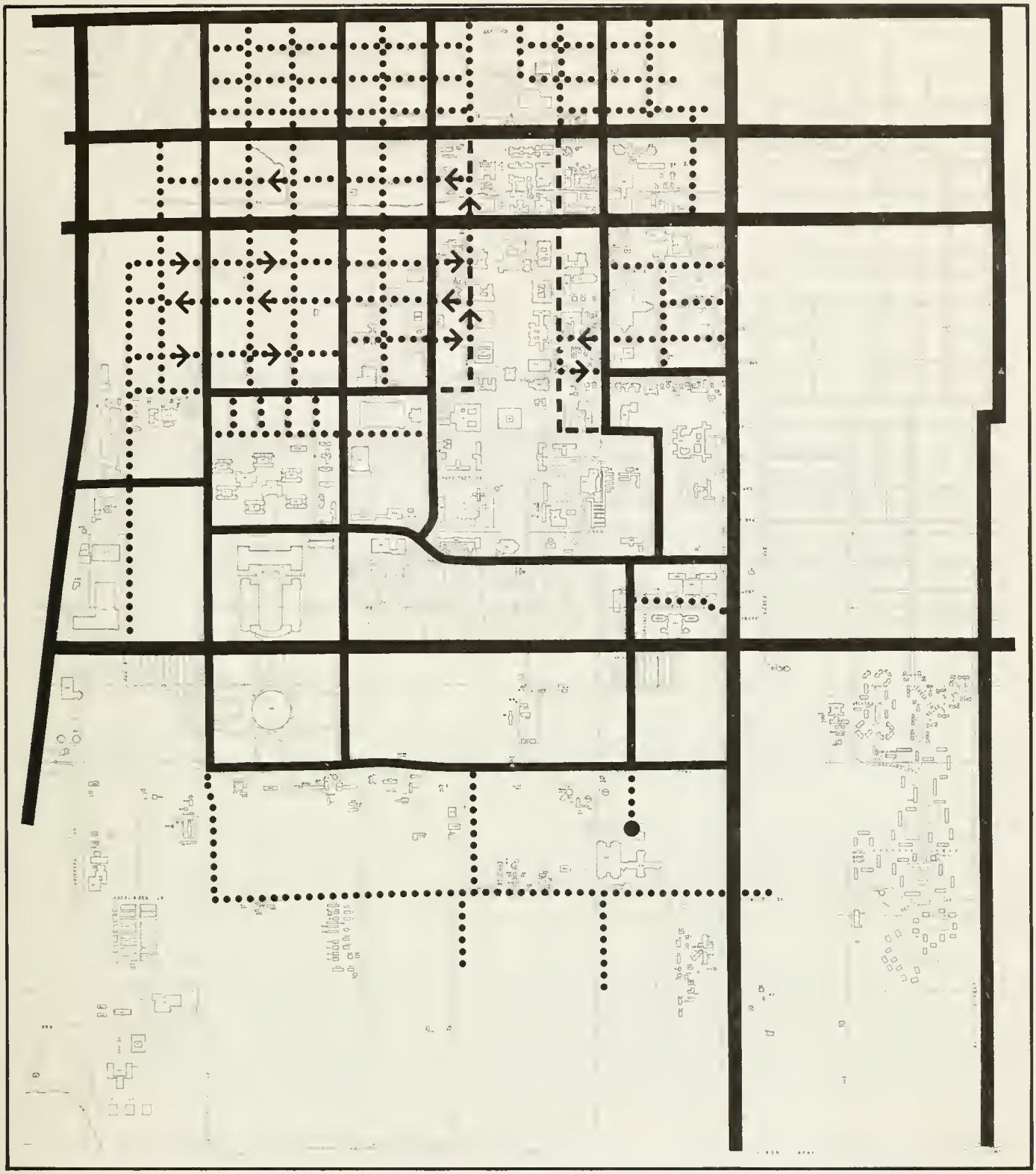


UNIVERSITY AREA TRANSPORTATION PLAN

- MAJOR THROUGH STREET
- COLLECTOR-DISTRIBUTOR
- LAND ACCESS
- SPECIAL-USE STREET
- STREETS CONVERTED TO LINEAR PARKING, CUL-DE-SAC, DIVERTERS, ETC., AND/OR INCLUDE BIKEWAYS

Figure 12

ALTERNATIVE CIRCULATION CONCEPT D



UNIVERSITY AREA TRANSPORTATION PLAN

MAJOR THROUGH STREET
COLLECTOR-DISTRIBUTOR
LAND ACCESS
SPECIAL-USE STREET

Figure 13
ALTERNATIVE CIRCULATION CONCEPT E

4.
EVALUATION AND SELECTION

The alternative concepts were subjected to public review and discussion. The latter was aided by some additional analysis, wherein, order of magnitude cost estimates were prepared. This review represented an initial screening in which certain ideas were deleted as being unworkable, not effective in achieving desirable results, redundant, or too expensive. The alternatives passing these initial tests were developed in further detail and evaluated. All of these results are discussed in the following sections.

Initial Screening

The various public discussions succeeded in identifying several key issues which resulted in changes to the set of alternatives. These issues are summarized as follows:

1. *Function of Green Street.* This concerns the historical role played by the street and the important function of orienting motorists, the access provided to the Lincoln Square shopping area and the need for front door vehicle access to commercial land-uses.

2. *Balanced Transportation.* This concerns the need to maintain some mix of different modes in the overall transportation system. Any tendency to move to extremes, such as: (a) allowing auto free movement everywhere, (b) moving the majority of parking to remote locations, or (c) closing many streets to all but pedestrian use; would be met with considerable opposition. The interested agencies reflect a range of differing values and priorities, hence, a multi-modal system with its inherent trade-off is needed.

3. *South Campus Development.* The planned development of the south campus extends the campus core (i.e., pedestrian zone) south to Pennsylvania. Based upon development concepts, the use of Peabody as a continuous street in the core is undesirable.

4. *Financing.* Clearly, transportation improvement funds are limited. The conclusion of a large number of special projects which involve environmental improvements and create limited street usage (buses, pedestrians and/or bicycles) is infeasible. Special projects need to be used where there is a major benefit directly related to the transportation safety and efficiency of the study area.

On the basis of these concerns, the following changes to the set of alternatives has been undertaken.

Alternatives Eliminated

Circulation Concepts A and C were dropped from further consideration. Some of the ideas would be reconsidered for possible use in the final recommendation. The reasons for these deletions are as follows:

1. *Alternative A*

   a. The scheme includes the idea of closing one block of Green Street to vehicle traffic (Wright-Sixth).

   b. The implementation potential of this idea was nil since major participants indicated their total lack of support.

   c. A general review of traffic demand, both peak volumes and patterns, indicated that congestion could become a major problem because capacity would be reduced in the east-west Green-to-University Avenue corridor. Windsor Road might help, but origin-destination information suggests that the diversion potential would be significant enough to affect diminished capacity.

   d. Other elements of the scheme are included in Alternative D or E.

2. *Alternative C*

   a. This scheme is similar to Alternative B.

   b. The maximum use of one-way streets via an alternating pattern of one-ways uses nearly all streets.

   c. Pedestrianization objectives would be limited significantly, although one-ways can reduce traffic conflicts.

   d. Utilize Fifth Street for significant circulation role; this street would not serve this role well without substantial reconstruction.

   e. Increases around-the-block circulation inconvenience as compared to Alternative B.

   f. Overall, the benefits of this scheme are very minimal.

Elements Modified

A few elements in the remaining concepts (Parking A, B, C, and Circulation B, D, E) were modified to reflect certain physical constraints, committed programs, and other site factors. Specific modifications were:

Parking A

1. Refine concept by eliminating certain facilities originally involved in consolidation because (a) lot owned by university housing and not connectible to regular university parking lots, (b) access changes not feasible because of emerging vehicle or service access requirements, and (c) consolidated access would yield little or no benefit. These changes were distributed throughout the scheme.

2. Refine concept by adding some facilities where consolidation opportunity is present, this tends to be concentrated in the east section of the study area between Green and Nevada.

Parking B

Location of new garages were adjusted to reflect more likely site acquisitions. Changes were:

1. Northeast garage moved from Goodwin and Green to possible alternative location on Illinois Street between Lincoln and Gregory Place (south of Illinois).

2. Northwest facility relocated and separated into two facilities; one at the site of the existing City of Champaign Lot "J" (Sixth at Green) and the second at the southeast corner of Sixth and John.

Parking C

The location of satellite parking facilities was changed to add more facilities in keeping with more likely supply requirements to have a meaningful concept and to achieve better geographical distribution of facilities. The changes include:

1. Adding a new facility in the athletic field area at University and Wright.

2. Expanding facility near Florida and Lincoln.

The use of the athletic field is an opportunity resulting from the possible need to develop a new athletic field elsewhere in the campus area. The site is identified here as a useful one for parking. However, overall land-use studies for the north campus are needed to verify this reuse.

Also, a two-route shuttle bus system was identified to serve the satellite lots providing convenient access to the edge of the campus core.

Circulation B

Street facilities are changed as follows:

1. Convert Pennsylvania to two-way collector from Fourth to Lincoln; eliminate Peabody through south campus.

2. Change two-way to one-way transition for Green and Springfield to take place at Prospect (not State and Randolph) in Champaign; and to take place at Cedar Street (or possibly at Coler) so that Springfield can continue to be two-way from Race Street to Main Street.

3. Eliminate cul-de-sac for College Court at Lincoln.

Circulation D

System changes would be as follows:

1 . Eliminate cul-de-sac for College Court.

2. Allow local access function for Wright Street between Chalmers and Armory.

Circulation E

This concept remained unchanged.

Capital Cost Implications

To test the cost implications of the alternative concepts, order of magnitude cost estimates[1] were prepared. The results are summarized in Tables 2, 3, and 4 for the parking schemes and Tables 5, 6, and 7 for Circulation Schemes B, D, and E, respectively.

These costs can be further subdivided as follows to distinguish primary projects from special street projects.

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[1] The unit costs used are from a number of recent street improvement and transit mall projects throughout the midwest. They may be at variance with local experience relative to individual construction items.

Table 2
ESTIMATED CONSTRUCTION COST FOR PARKING LOT CONSOLIDATION--CONCEPT A

Lot ID	Description	Cost(1)
A-4	Close entrance to Wright Street	$ 6,500
B-12	Close southern entrance to lot B-12	5,700
	Widen remaining entrance to B-12	500
	Pave strip between upper and lower B-12 lots	2,000
B-16	Close Stoughton Street entrance	3,500
	Extend lot to south	6,000
	Build new entrance onto service street	1,200
B-18	Close Springfield Avenue entrance	3,500
	Build entrance onto service street	1,000
C-3	Close Wright Street entrance	15,500
	Close all Sixth Street entrances/exits	16,500
	Remove 20 feet of westernmost parking median	500
C-8	Close middle entrance on Fifth Street	7,000
	Extend lot eastward, removing median barrier between upper and lower lots	7,500
C-9	Close Sixth Street entrance	3,500
	Remove 12 feet of eastern edge of median barrier	300
D-9, D-23	Close Lincoln Avenue access to D-9 and provide new access from Illinois Street	5,000
	Close westerly access to D-23 on Illinois Street and provide connection to D-9	5,000
D-11	Close westerly drive on Illinois Street	3,000
D-20, D-22	Close California Street entrances to lots D-20, D-21	17,000
	Build entrance from D-20 to Gregory Place	2,500
	Connect parking lots	14,000
E-2	Widen Lorado Taft entrance	1,000
E-2, E-40, E-41	Consolidate southern lots	65,000
	Close entrances from lots E-40 and E-41 on Peabody Drive	3,000
	Build new entrance on Peabody Drive	600
F-4	Consolidate lots in F-4	9,500
	Close first and third entrances on Lorado Taft	16,000
	Close entrance on Goodwin Avenue	8,500
F-14	Close Peabody entrance closest to Goodwin	2,000
	Remove 15 feet of both ends of parking median	500
	Total:	$233,300

(1)Estimate includes, where appropriate, the cost of the following:
-- Pavement removal and/or installation.
-- Sidewalk removal and/or installation.
-- Curb and gutter removal and/or installation.
-- Landscaping; no land costs included.

Table 3
ESTIMATED CONSTRUCTION COST FOR PARKING REPLACEMENT--CONCEPT B

Item	Description	Cost[1]
East Parking Garage	1,000 spaces	$ 4,000,000
Southeast Parking Garage	800 spaces	3,200,000
Southwest Parking Garage	700 spaces	2,800,000
West Parking Garage	600 spaces	2,400,000
Northwest Parking Garage	300 spaces	1,200,000
		$13,600,000

(1) Cost includes lighting, striping, entrances and exits, and incidental landscaping, no land costs included

Table 4
ESTIMATED CONSTRUCTION COST FOR SATELLITE PARKING-- CONCEPT C

Item	Description		Cost
North Remote Lot	1,000 stall surface parking lot (1)		$1,000,000
Southeastern Remote Parking Lot	400 stall surface parking lot (1)		400,000
		Subtotal:	$1,400,000
Bus Stop Shelters	Enclosed, heated, lighted shelters		
	-- North Remote (two 20-person shelters)		$ 30,000
	-- Southeastern Remote (two 30-person shelters)		40,000
	-- Southwestern Remote:		
	- two 20-person shelters		30,000
	- two 30-person shelters		40,000
	- one 40-person shelter		25,000
		Subtotal:	$ 165,000
Shuttle Buses	Fourteen 40-foot GM-type diesel coaches. Seats 37 persons, including six wheelchairs, wheelchair lift equipped		$1,680,000
		Grand Total:	$3,245,000

(1) Includes grading, drainage structures, paving, lighting, striping, and incidental landscaping.

Table 5
ESTIMATED CONSTRUCTION COST FOR CIRCULATION--CONCEPT B

Item	Description		Cost
New Signalized Intersections			
Fourth and Pennsylvania	Signal heads, controls, mounting hardware		$ 45,000
Pennsylvania and Lincoln	Signal heads, controls, mounting hardware		45,000
		Subtotal:	$ 90,000
Transit/Bikeway Streets (1)			
Mathews	From Nevada to Gregory		$1,056,000
Gregory	From Mathews to Goodwin		795,000
Mathews	From California to Green		1,425,000
Wright	From Chalmers to Daniel		635,000
Wright	From John to Green		670,000
		Subtotal:	$4,581,000
Intersection Reconstruction			
Peabody and Pennsylvania			$ 61,000
Nevada and Mathews			4,000
California and Mathews			4,000
Wright and John			5,000
Wright and Daniel			5,000
Wright and Chalmers			5,000
		Subtotal:	$ 84,000
New Street Construction			
Goodwin-Gregory Connector			$ 98,000
		Grand Total:	$4,853,000

(1) Includes two 12-foot bus lanes, two five-foot bike lanes, sidewalks, lighting, street furniture, and mall-type landscaping of remaining right-of-way.

Table 6
ESTIMATED CONSTRUCTION COST FOR CIRCULATION CONCEPT D

Item	Description		Cost
New Signalized Intersections			
Peabody and First			$ 45,000
Pennsylvania and Fourth			45,000
Pennsylvania and Lincoln	(Signal heads, controllers,		45,000
Green and Fourth[1]	mounting hardware, and		45,000
Green and Sixth[1]	cables.)		45,000
Green and Wright[1]			45,000
Green and Mathews			45,000
Lincoln and Nevada			45,000
		Subtotal:	$ 360,000
Transit/Bikeway Streets[2]			
Mathews	From Nevada to Gregory		$1,056,000
	From California to Green		1,425,000
Gregory	From Mathews to Goodwin		795,000
Wright	From Chalmers to Armory		825,000
	From John to Green		670,000
Armory	From Wright to Sixth		660,000
		Subtotal:	$5,431,000
Streets Converted to Bikeway/Sidewalk[3]			
Gregory Drive	From Sixth to Mathews		$1,023,000
Armory	From Fourth to Fifth		330,000
	From Locust to Second		512,000
Oak	South of Armory		150,000
Oregon	From Mathews to Lincoln		2,001,000
California	From Gregory to Lincoln		310,000
Peabody	From Euclid to Fourth		234,000
Wright	From Healey to Green		531,000
		Subtotal:	$5,091,000
Intersection Reconstruction			
Armory and Second			$ 4,000
Armory and Locust			4,000
Armory and Oak			4,000
Nevada and Mathews			4,000
Mathews and California			4,000
Wright and Chalmers			5,000
Wright and John			5,000
Wright and Healey			5,000
Peabody and Pennsylvania			61,000
		Subtotal:	$ 96,000

[1] These intersections have signals, but installation would be completely reconstructed corresponding to street improvement project.

[2] Includes two 12-foot bus lanes, two five-foot bike lanes, sidewalks, lighting, street furniture, and mall-type landscaping of remaining right-of-way.

[3] Includes 10-foot bikeway/sidewalk, lighting, street furniture, and landscaping.

Table 6
ESTIMATED CONSTRUCTION COST FOR CIRCULATION CONCEPT D (cont'd)

Item	Description		Cost
Street Closure (cul-de-sacs)			
Oak North of Gregory			$ 3,000
Euclid North of Peabody			3,000
		Subtotal:	$ 6,000
Linear Parking Streets with Pedestrian-Bikeway			
Type 1:			
Daniel	From Fourth to Wright		$ 180,000
Pennsylvania	From Lincoln to Busey Avenue		40,000
Third	From Armory to Gregory		52,000
Arbor	From Armory to Gregory		52,000
Chalmers	From Oak to Fourth		317,000
John	From Fourth to Oak		282,000
Oak	From John to Daniel		40,000
Healey	From Locust to Fourth		239,000
Stoughton	From Wright to Fourth		158,000
Clark	From Wright to Fourth		158,000
Type 2:			
Fifth	From Armory to Green		216,000
Green	From Fourth to Wright		185,000
		Subtotal:	$ 1,919,000
Pavement Removal and Landscaping			
Romine	From Clark to University		$ 107,000
Harvey	From Clark to University		96,000
Stoughton	From Mathews to Goodwin		132,000
Stoughton	From Gregory to Lincoln		96,000
Harvey	From Stoughton to Springfield		78,000
		Subtotal:	$ 509,000
Widening Springfield Avenue			
Widen to 44 Feet	From railroad tracks to Race		$ 192,000
		Subtotal:	$ 192,000
Bikeway Underpass	Under railroad tracks at John		$ 330,000[4]
		Subtotal:	$ 330,000
New Street Construction			
Goodwin-Gregory Connector			$ 98,000
		Grand Total:	$14,032,000

[4] Source: City of Champaign.

Table 7
ESTIMATED CONSTRUCTION COST FOR CIRCULATION--CONCEPT E

Item	Description	Cost
New Signalized Intersections		
Peabody and Fourth		$ 45,000
Armory and Fourth		45,000
Pennsylvania and Lincoln		45,000
Nevada and Lincoln		45,000
Springfield and Mathews		5,000
	Subtotal:	$ 225,000
Street Converted to Transit/Bikeway(1)		
Gregory	From Mathews to Goodwin	$ 795,000
Mathews	From Nevada to Gregory	1,056,000
Mathews	From California to Green	1,425,000
Armory	From Wright to Sixth	660,000
Wright	From Chalmers to Armory	825,000
Wright	From Daniel to John	620,000
Wright	From Healey to Springfield	673,000
	Subtotal:	$6,054,000
Street Converted to Bikeway/Sidewalk(2)		
Mathews	From Green to Springfield	$ 582,000
Gregory	From Sixth to Mathews	1,023,000
	Subtotal:	$1,605,000
Intersection Reconstruction		
Peabody and Pennsylvania		$ 61,000
Pennsylvania and Sixth		5,000
Mathews and California		4,000
Nevada and Mathews		4,000
Wright and John		5,000
Wright and Daniel		5,000
Wright and Chalmers		5,000
Wright and Healey		5,000
	Subtotal:	$ 94,000
Widening Springfield Avenue		
Widen to 44 Feet	From railroad tracks to Race Street	$ 192,000
	Subtotal:	$ 192,000
New Street Construction		
Maryland Extension	From south of St. Marys Road to south of Florida	$ 87,000
Goodwin-Gregory Connector		98,000
		$ 185,000
	Grand Total:	$8,355,000

(1) Includes two 12-foot bus lanes, two five-foot bike lanes, sidewalks, lighting, street furniture, and mall-type landscaping of remaining right-of way.

(2) Includes 10-foot bikeway/sidewalk, lighting, street furniture, and landscaping.

Parking Concepts

	A	B	C
New Parking Facilities	$ 16,300	$13,600,000[1]	$1,400,000[1]
Street/Access Improvements	217,000	--	--
Shuttle Transit Service			
-- Equipment and Facilities	--	--	1,835,000
-- Capitalized Net Operating Cost	--	--	554,000[2]
Total:	$ 233,300	$13,600,000	$3,799,000

Circulation Concepts

	B	D	E
Street Widening, New Streets	$ 98,000	$ 346,000	$ 336,000
Intersection Improvements	84,000	96,000	94,000
Traffic Signal Improvements	90,000	360,000	225,000
Subtotal:	$ 272,000	$ 802,000	$ 655,000
Special New Streets, Transitways and Bikeways	$4,581,000	$13,230,000	$7,700,000
Total:	$4,853,000	$14,032,000	$8,355,000

The costs indicate that:

1. Many of the special streets use standards that would be too luxurious, and would not be germane to the solving of key problems in the study area, or were related more to land-use development programs beyond the scope of this study; the effect of this finding is to reduce the set of special streets down to only four—Wright Street, Mathews Avenue, Gregory Place, and Green Street.

2. The design assumptions for individual projects may be too extensive resulting in very high unit costs; these need to be reviewed and lowered.

3. Parking facility expansion is quite capital intensive and will require some form of bond financing.

4. The basic street and traffic costs appear to be within reasonable resource limits.

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1 Cost of new driveways/access included.

2 Amount of a sinking fund needed to provide $57,000 per year.

Evaluation Analysis

For the amended set of alternative concepts, evaluation analysis was undertaken to provide more specific information describing the relative merits of the schemes. These analyses concerned: traffic and safety impacts, transit route impacts, circulation and land-use access, and implementation potentials.

Traffic and Safety Impacts

Analysis of traffic had two principal purposes: (1) identify travel patterns and (2) identify future peak-hour volumes (corresponding to alternative street and parking schemes). The former provided a basis to understand travel demand relative to the circulation schemes testing them for functional reasonableness. The latter was used to make volume to traffic capacity comparison. These reflect level of service expectations answering workability questions about the schemes.

Travel Patterns

Travel data and forecasts developed for the Champaign-Urbana Urbanized Area Transportation Study and by Illinois Department of Transportation were used to describe overall travel patterns. These patterns describe the probable role or function for the primary streets in the study area: Green, Springfield, Florida, Lincoln, First, and Fourth Streets. Using a special computer technique, the origin-destination pattern for users of these streets were estimated.

Overall, the information describes an average weekday direction of approach defined by travel oriented to the four corners of the study area:

Northwest (First at Green/Springfield)	39%
Northeast (Lincoln at Green/Springfield)	22
Southeast (Lincoln at Florida)	17
Southwest (First at Florida)	22
	100%

In contrast, the distribution of weekday destinations within the study area is generally as follows:

North campus (north of Green)	19 %
Northeast sector (Green to Gregory Drive, east of Wright)	32
Southeast sector (south of Gregory Drive, east of Wright extended)	21
Southwest sector (south of Gregory Drive, west of Wright extended)	7
Northwest sector (Green to Gregory Drive, west of Wright)	21
	100%

These two distributions can be compared in a macroscopic manner by imagining the study area to be composed of two halves—either divided by a north-south centerline or an east-west centerline. The division of approach and destinations on this basis are as follow:

	Reference Street Wright Street		Reference Street Gregory Drive	
	Percent West	Percent East	Percent North	Percent South
Approach	61%	39%	61%	39%
Destination	30%	70%	72%	28%

The significance of these comparisons is that there is imbalance between approach and destination proportions when referenced to Wright Street. This creates an important function for the street system to provide efficient distribution in an east-west direction from approach routes in Champaign to the main sections of the campus. That is, maintaining connections between Green, Springfield, and Florida to the streets providing direct access to the campus (Goodwin, Pennsylvania, Matthew, Gregory, etc.) is essential.

Considering these patterns relative to individual streets, the following was identified:

Street	Location	Principal Travel Pattern
University Avenue	Near Lincoln	Forty percent appears to be east-west through traffic. Twenty percent travels to and from areas north along Lincoln. Fifteen percent appears to travel to and from the study area via Wright, Sixth, Fourth, and First.
Springfield Avenue	Near Lincoln	Ten percent appears to be east/west through traffic. Forty percent appears to travel to and from study area via Wright, Sixth, and Fourth. Twelve percent appears to connect to Lincoln Avenue for access to the east campus area.
Green Street	Near Lincoln	Five to 10 percent appears to be east-west through traffic. Another six to 13 percent appears to be through traffic using a Lincoln-Florida path. Forty percent appears to travel to and from the study area. About one-third of the trip ends are located at Lincoln Square.
Green Street	West of First Street	About 10 percent is east-west through traffic. About 60 percent travel to and from study area via First, Fourth, Sixth, and Goodwin. About 60 percent of trips ends located in Neil Street corridor to north. About 20 percent of trip ends located in Green Street corridor to west.
Florida Avenue	Near Lincoln Avenue	Twenty to 25 percent appears to be east-west through traffic. Twenty percent travels to and from study area via Pennsylvania. Twenty percent travel north along Lincoln. Ten percent travel along First Street corridor.
Florida Avenue	East of Neil Street	Twenty-five to 30 percent appears to be east-west through traffic. About 30 percent uses First for access to west campus (Gregory and Peabody). About 10 to 15 percent use Fourth Street for access to south campus (Pennsylvania).
Lincoln Avenue	North of University Avenue	About 55 percent of travel is to and from Urbana (east of Lincoln). Thirty-five percent is travel to and from study area.
Fourth Street	South of Green	About 80 to 90 percent travel to and from campus area. Origin of campus traffic is 15 to 20 percent from North Fourth Street, 35 percent from First and Neil Streets, and 35 percent from Green Street west.

These patterns mean that:

- Green Street needs to be able to distribute traffic to all north-south study area streets from each direction. Through traffic is minimal. The overlapping of study area trips from Urbana and Champaign create high volumes that are generally equally by direction.

- The linkage between Bradley and First Street is important. First Street is more important than Fourth Street.

- Springfield Avenue appears to be a more important approach route for Urbana origins.

- University Avenue is a through route with small usage by study area trips.

- Florida Avenue is a significant through traffic route, including a linkage to Lincoln Avenue to the north.

The presence of through (non-study area) traffic is a potentially important issue. Based upon the CUUATS trip data, the aggregate proportions on the principal routes (measures at the boundary of the study area) by trip type are:

Through	20 %
External Study Area	46
Internal (to study area)	34
	100 %

The total trips (current level) amount to 118,000 vehicles per day. Through trips are 23,000 vehicles per day. There are four primary desire lines (origin-to-destination connections) for these movements:

1. Due east of study area to northwest.
2. Due east of study area to southwest.
3. Southwest of study area to northeast.
4. Northwest of study area to due south.

If the maximum amount of these trips is to be bypassed around the study area to reduce traffic demand inside the study area, the performance of the following connections is important:

- University-Lincoln.
- First-Bradley.
- Springfield-Neil.
- Neil-Florida.
- Florida-Lincoln.
- Capacity along the entire length of Lincoln Avenue.

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These patterns suggest that there are some through trips and external study area trips that could use a Windsor Road connection between Urbana and Champaign. The potential to divert trips from existing east-west routes seems modest at best, i.e., probably in the order of magnitude of 5,000 vehicles per day.

Estimated Traffic Volumes

The analyses of travel patterns provide needed insights and understandings of the functions the various streets need to have. The data also provides a base for estimating how traffic flow might change or respond to the parking and circulation concepts.

Peak-hour traffic volumes, recorded in 1976, are used as the benchmark. Table 8 summarizes these volumes and the estimated volumes for Circulation Concepts B, D, and E. These figures depict peak hour by peak direction. Further, even though these volumes are based on 1976 counts, they are usable planning numbers since traffic volume increases on study area streets has been minimal.[3]

These estimates indicate that the most dramatic changes would be produced by the different one-way operations, i.e., Green/Springfield and Fourth/Sixth pairs. In these cases, volumes would exceed capacity at Level of Service C. However, this excess load would not render the system unworkable.

The estimated loads on Green Street under Scheme D would be a problem given the assumption to reduce street capacity in the campus town area. Demand would be more than 60 percent in excess of capacity.

Another significant result is that Pennsylvania would need a four-lane cross section to accommodate the peak-hour traffic. Diversions from Gregory Drive adds traffic. As will be noted later, the location of more parking increases this potential further.

With respect to the parking concepts, Table 9 summarizes estimated changes. Concept A would produce very limited or insignificant changes. Concept B causes some rearrangement on local and study area collector streets but not on approach routes. Large concentrations of parking in a single facility create high turning volumes. Assuming a sufficient access system is designed, Concept B should be workable.

Concept C causes the expected reduction of volumes on interior study area streets. Traffic is intercepted at the edge of the study area. These results would be desirable.

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[3] Comparison of 1970 to 1976 volumes by screenline shows one percent annual growth.

Table 8
ESTIMATED PEAK-HOUR TRAFFIC VOLUMES FOR CIRCULATION CONCEPTS

Street	Location	Existing[1] Capacity	1976 Volume	Estimated Alternative B	Estimated Alternative D	Estimated Alternative E
University	Third to Fourth	930	1,015	1,015	1,015	1,015
Springfield	First to Second	820	690	1,580	800	800
Springfield	Sixth to Wright	700	560	1,440	740	740
Springfield	Gregory to Lincoln	820	670	1,590	780	780
Green	Fourth to Fifth	700	910	1,580	800	720
Green	Wright to Mathews	1,210	960	1,540	850	850
Green	Gregory to Lincoln	990	920	1,590	810	810
Pennsylvania	Fourth to Sixth	580	275	550	350	350
Pennsylvania	Goodwin to Lincoln	580	400	400	400	400
Florida	Oak to Neil	900	990	990	990	990
Florida	West of Lincoln	990	690	690	690	690
Lincoln	North at Florida	810	420	420	420	420
Lincoln	Green to Illinois	810	700	700	700	700
Goodwin	North of Pennsylvania	250	220	250	250	250
Goodwin	Green to Illinois	810	390	540	540	600
Sixth	Green to Healey	1,300	460	630	560	460
Sixth	Green to John	1,300	570	610	480	470
Fourth	Green to John	780	470	1,040	350	500
Fourth	Armory to Gregory	780	480	950	370	460
First	Green to John	530	570	520	570	570
First	Stadium to Gregory	530	610	610	650	610

(1) Approximately equivalent to Level of Service C, capacity is for one direction on two-way streets.

Table 9
ESTIMATED CHANGES IN PEAK-HOUR TRAFFIC VOLUMES
PRODUCED BY ALTERNATIVE PARKING CONCEPTS

Street	Location	Parking Concept B "Replacement"	Parking Concept C "Satellite Parking"
Green	Mathews to Lincoln	+60	-55
Green	Fourth to Sixth	+30	-100
John	Fourth to Sixth	+80	-40
Daniel	Fourth to Sixth	+80	-25
Illinois	Gregory to Lincoln	+60	-20
Pennsylvania	Fourth to Sixth	+150	-40
Sixth	Green to Healey	+90	-70
Sixth	Pennsylvania to Peabody	+80	-40
University	Sixth to Wright	NC	+100
Fourth	Green to John	+80	-35
Fourth	North of Florida	+80	-75
Florida	West of Lincoln	NC	+155
Springfield	Wright to Mathews	NC	-50
First	John to Green	+20	-85
First	Stadium to Peabody	+40	-90

Safety Impacts

Since the alternatives being examined represent systems of service as contrasted to specific facility designs, the assessment of safety impacts can only be general. As noted earlier in this report, accident hazards exist because of the following situations which regularly occur:

1. Pressurized driving environment along Green Street, i.e., motorists attempt to move quickly, but in the face of many probable delays.

2. Concentrations of trips by different modes in compact area leading to conflicts.

3. Pavement limitations with no room for left-turn lanes and associated visibility problems.

The alternatives reflect different approaches to find relief to their problems. These are:

1. Increased separation of modes via functional planning of streets.

2. Use of special streets to restrict movement of autos.

3. Use of traffic control systems to achieve smoother flow of traffic.

4. Reduction in auto access—pedestrian conflict points.

5. Provision of more traffic capacity.

6. Better accommodation of left-turn movements.

7. Reduction in auto traffic volumes in streets nearby edge of campus core.

The alternative concepts employ or provide emphasis to the above as follows:

Parking A (consolidation)	Number 4
Parking B (replacement)	Number 4, Number 7 (limited)
Parking C (satellite)	Number 4, Number 7
Circulation B	Number 5, Number 3, Number 6
Circulation D	Number 2, Number 1, Number 3
Circulation E	Number 3, Number 1, Number 6

All the alternatives would produce some accident potentials reduction. The combination of Parking Concept C and Circulation Concept B might produce the maximum reduction potential. Whether this is the best overall plan depends on many other considerations discussed in this chapter.

Transit Route Impact

Referring back to Figure 4, the existing MTD transit routes would be affected by the circulation schemes. This is caused by changes in one-way or two-way street operations and creation of special streets.

Given an overall objective to enhance the effectiveness and attractiveness of transit service for trips to and from the study area, the location of transit service (including bus stops) and operating conditions (i.e., traffic flow) for buses are primary considerations. Because the university is the largest single (although dispersed among many buildings) generator of transit trips in the region, close proximity (minimum walking distance) to the edge of the campus core should be maintained and improved where possible. Moreover, the MTD requires that, to the maximum extent, routes should operate in both directions on the same street. The intent is to maximize patron convenience and understandability of the service.

Considering the three circulation concepts, the impacts on transit service would be:

Circulation B

1. The Green/Springfield one-way couple would require that seven routes, now routed along one or both of these streets, would have to be split into eastbound and westbound directions.

2. To avoid some route splitting, service could be relocated on certain parallel streets, i.e., Illinois, Healey, John, or Stoughton. Some of these streets are narrow and would entail certain bus movement problems.

3. Routes could be concentrated (two-way) on three special streets—Wright, Mathews, and Gregory Drive.

4. Capacity improvements would improve traffic speed on Green and Springfield.

Circulation D

1. Route splitting would not be necessary, however, travel speed on Green Street through the campus town area would be reduced (compared to existing) because of special improvements.

2. Routes could also be concentrated (two-way) on three special streets—Wright, Mathews and Gregory Drive.

Circulation E

1. Conditions would be generally the same as existing.

2. Routes could also be concentrated (two-way) on three special streets—Wright, Mathews, and Gregory Drive.

The most negative impact would be the route splitting necessitated by Concept B. It could be agreed that the effects on patronage would be minimal since an existing one-way route situation (Sixth-Wright) is converted to two-way operation in a substantially improved environment. The route most impacted upon would be the Green route since it is long distance, east-west, service between Urbana and Champaign. Some persons getting on or off buses on Green Street would be inconvenienced or confused by having to walk to Springfield Avenue stops for the return trip. Conversely, Wright and Mathews would be given a strong transit identity and allow patrons greater flexibility in choosing transit service (more routes, both directions).

An alternative to route splitting would be to allow counter flow bus operations on one-way streets (Green and Springfield). This technique is used in many places. It entails certain accident risks and potential delays if a single bus lane is blocked by a disabled vehicle or illegal parking/loading. In a limited and controlled application where adequate pavement widths were available and when the general level of people activity and other distractions (to the motorist) was low, this technique would be satisfactory. However, the Green Street environment would seem to be the opposite situation representing a potentially dangerous operating condition.

The impact created by Concepts D and E is marginal and positive. Parking concepts do not cause a change in transit service except that the satellite scheme involves a new shuttle bus service. This would be a supplement to regular MTD service. Moreover, reducing the convenience of parking (Number B and Number C) might generate some added transit trips. Given the auto orientation of the area, this would be minimum.

Circulation and Land-use

A third category for evaluation analysis concerns circulation and land-use, that is, the quality of access, clarity of the system, provision of needed "front door" access, and the flexibility for use during emergencies and special events. Table 10 summarizes these findings. The attempt was made to employ a common set of criteria for all circulation and parking concepts.

Table 10
EXPECTED PERFORMANCE BY ALTERNATIVE CONCEPTS: CIRCULATION AND LAND-USE RELATIONSHIPS

Criteria	Circulation Concepts			Parking Concepts		
	B	D	E	A	B	C
1. Quality of Access						
a. Balanced Circulation	All one-way couples are complete; no missing intersections.	Basically a two-way system.	One-way operations on Wright and Healey are unbalanced although paralleling two-way streets provides needed return flow.	NA	Parking supply shifted to improve balance with direction of approach.	Same as "B"
b. Around-the-Block Circulation	Intersecting one-way systems restrict circulation in some blocks; produces desirable separation in university and commercial traffic flows.	No restraints.	No restraint.	NA	NA	NA
2. Clarity of System						
a. Regularity and Uniformity	One-ways use in regular alternative fashion.	Fifth/Sixth Street pair is somewhat irregular without clarity of purpose.	Some irregularities in one-way.	Larger facilities allows more flexible, less specialized parking.	Fewer facilities, more uniformity.	Satellite facilities would have uniform level of service.
b. Connections to Regional System	Some one-way/two-way transition problems, particularly accute in Urbana.	No transition problems.	No transition problems.	Existing condition.	Improved accessibility from approach routes.	Improved accessibility from approach routes.
c. Directness	Access to "Union" from east more circuitous; otherwise flow from approach route to destinations direct.	Historic role of Green Street changed, creates confusion and need to force through traffic to circulate around via Springfield Avenue.	Basically the same as existing plus Sixth Street provided two-way access.	Existing condition.	Longer walking distances required.	Mode change needed, therefore, indirect.
3. Land-use Relationship						
a. Provides Needed "Front Door" Access	Only access missing is on Wright Street, John to Green.	Access problem on Wright Street, John to Green and Chalmers to Armory.	Access problem on Wright, Chalmers to Armory.	NA	NA	NA

NA--Not applicable

Table 10
EXPECTED PERFORMANCE BY ALTERNATIVE CONCEPTS: CIRCULATION AND LAND-USE RELATIONSHIPS (cont'd)

Criteria	Circulation Concepts			Parking Concepts		
	B	D	E	A	B	C
3. Land-use Relationship (cont'd)						
b. Penetration of Land-use Districts	Increases amount of non-study area traffic along Green Street through campus town. May encourage commercial development in Green-Springfield corridor. Strong Green Street separates north campus more, although one-way is less of a conflict to pedestrian crossings.	Reduces nature of traffic separation for north campus by Green Street. Extensive special streets to aid residential neighborhoods.	One-way Healey and John may function as relief to Green and represent a residential penetration west of Fourth Street.	Continued scatterization.	Reduces scatter, places parking in compatible locations.	Reduces scatter, but resistance to satellite parking may cause increased neighborhood encroachment.
4. Flexible Uses						
a. Emerging Vehicle Movement	Increased one-ways may increase traffic conflicts for emerging vehicles, but no paths are eliminated.	Green Street special design allows emerging vehicle access but is problem for such vehicles traveling through area.	No problems of significance.	Fire station access protected.	NA	NA
b. Special Operations Potential (athletic or other university events)	System is compatible with special events operations plan--no streets are eliminated that are needed for stadia access.	Same as for "B"	Same as for "B"	NA	Would add more parking supply in large increments usable for special events.	Would add more parking plus setting-up a shuttle bus system that could be used.

NA--Not applicable

Because there are so many considerations, it is difficult to find best performance by a single concept. There are trends or conclusions evident in this analysis:

1. Concept E appears to have the fewest problems, but it represents the existing system without attempting to do very much.

2. The through street role for Green Street in Concept B produces certain circulation and access problems. The pattern of around-the-block circulation in the campus town area creates desirable separation of institutional and commercial circulation.

3. Parking Concepts B and C would contribute to achieving access and land-use relationship benefits.

Implementation Potential

The final category in the analysis concerns implementation potential. The considerations here are:

1. Physical feasibility.
2. Financial feasibility.
3. Acceptability.
4. Stageability.

The following paragraphs describe how the concepts would perform.

Physical Feasibility

This concerns the ability to fit the scheme into the space available.

Parking A. The lot consolidations can work. Space is available, land is generally controlled by the university.

Parking B. The general site locations were refined to select places that appear to be available. The east garage site would have to be assembled, some Urbana street right-of-way included and possibly a few older residences would be acquired. The southeast and southwest garages would be on university land and readily fit in space suggested. The west garage would require relocation of the parking office, but would utilize university land. The northwest facility would utilize City of Champaign property and, desirably, involve acquisition of privately-owned land. Previous studies indicate a garage would fit on the site.

Parking C. The two new parking facilities would readily fit on university land. The north facility would be contingent upon the relocation of the athletic fields elsewhere in the campus. The shuttle bus system is operationally feasible, i.e., capacity and level of service possible.

Circulation B. The transition between one-way and two-way operations for Green/Springfield in central Urbana at Race Street would be difficult. Race Street in the block south of Springfield is narrow with no opportunity for widening. Consideration of other crossover streets is necessary. This could be Cedar Street (one block west of Race Street). This is also a narrow street, but right-of-way widening potentials are greater (but still costly). Using Cedar Street allows Springfield Avenue to be two-way between Race and Cedar, a necessary operation because of the intersection of Main Street in this area. Coler Avenue is another possibility for the crossover.

The Champaign transition is more likely, but probably would need to be shifted west to Prospect due to traffic capacity issues at State and Randolph. The existing divided section of Green Street (Wright Street east) would need substantial change to fit into the one-way patterns. This is physically possible, but must be considered a problem.

Other aspects of this scheme would be feasible since right-of-way needs involve university land. The new Goodwin Avenue at Pennsylvania appears to be agreed upon. The crossover between Peabody and Pennsylvania through an existing parking lot is readily possible. The parking lot can be redesigned.

Circulation D. This scheme requires the improvement of Springfield Avenue via widening to four-lane width (desirably 44 feet) with a left turn additional at major intersections. This would generally fit in the existing right-of-way, but there is a line of trees in the terrace that would be affected. Reforestation would be a necessary part of the plan. A more difficult problem is the Springfield Avenue railroad underpass. The width of portals are substandard for two lanes, this would be a constraint since structural reconstruction would be a long-term project.

Other elements of the scheme are considered to be feasible. The special streets involve neither complete reconstruction, but rather existing right-of-way.

Circulation E. This scheme basically exists so that feasibility functions are moot.

Financial Feasibility

Detailed feasibility analyses have not been undertaken in this study. Financial implications can be identified, however. General project cost estimates were discussed earlier in this report. The costs for new streets, traffic control, and widening projects appear feasible. Discussions with participants suggest that these costs and possible sharing or proporting of them between the municipalities, MTD, and university were possible, subject to more reference and negotiation.

The projects for which difficulties are expected include parking garages, special streets, and shuttle transit service. The new garages (Parking B) represent a very capital intensive program. Without adding any land acquisition cost, the total annual owing cost[4] would be $450 to $500 per space. This is a sizeable burden to support with user fees and other resources. Other institutions are developing garages, so feasible ways are possible.

The special street projects could represent a very large investment. These need to be curtailed in extent and character. Further analysis indicates that this is possible. With these changes, the individual special street projects still represent a sizeable investment. Nonlocal funds (federal, state) can be used for the projects. Competitive uses for such funds is substantial. The benefits of the special streets would need to be recognized so that priority could be assigned for funding purposes. Thus, these projects (present in all circulation schemes) are not infeasible.

The shuttle bus service, Parking C, would be expensive. It would not be a self-supporting service. Other funds would be needed to support the service.

Acceptability

This consideration concerns the likelihood that the various improvements would be approved or accepted by persons affected by the improvement. The many public and staff discussions undertaken during the course of this study have attempted to identify likely reactions by user groups and implementing agencies to various concepts.

One cannot pre-judge what these reactions will ultimately be, but it is possible to take note of certain possibilities.

1. The changes in parking convenience implicit in Parking Concepts B and C are most likely to meet stiff resistance. This is understandable; overcoming these concerns may not be possible. Auto disincentives are never popular. It may be hoped that other objectives would be recognized that would make these two concepts possible.

2. The level of parking demand in the campus town area is very high. Until these demands are more satisfactorily accommodated, there will be reluctance to diminish curb parking supply even though the pavement space is urgently needed for traffic flow or other functions. This affects the scheme using more two-way operations (i.e., Concepts D and E) than one-way streets.

3. Environmental impacts associated with some widening projects would be expected. This would affect Springfield Avenue (Concepts D and E).

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[4] Assume long-term borrowing at seven percent and annual operating and maintenance cost of $125 per space.

4. The restriction of street use has, historically, been opposed. This will affect Wright and Mathews. The former is more controversial because of the mixed land-uses, curb parking reductions, and access.

Stageability

This consideration is important because it involves funding (or cash flow), allowing time to negotiate differences in projects, dealing with uncertainties about demand and user responses, and recognizing the need to sequence certain projects.

Given the improvements involved in each concept, staging opportunities appear to be as follows:

Parking A. The various consolidation projects are very stageable. Each one can be done as a separate project.

Parking B. Each garage can be undertaken individually, i.e., all do not have to be implemented simultaneously. Elimination of certain existing parking facilities would be tied to each garage project. The northwest garages might also be coordinated with changes in curb parking and, possibly, the Wright Street special improvement.

Parking C. The north lot needs to be staged subsequent to an athletic field relocation project. Shuttle buses must be made available to initiate the satellite concept. Simultaneous policies relative to parking fees and tighter controls are needed. This scheme needs to be implemented as a single package.

Circulation B. The key element is the one-way pairs. The Green/Springfield pair requires simultaneous implementation of the transition facilities or operations (Prospect Avenue in Champaign and Cedar or Coler Avenue in Urbana). New traffic signals along the one-ways would also be needed at the same time. Other projects are stageable.

Circulation D. The conversion of Green Street to a more local function needs to follow the Springfield Avenue improvement. Other projects are stageable.

Circulation E. There are no unique staging issues in this scheme other than converted Sixth Street to two-way operations preceding the Wright Street projects and the upgrading of Pennsylvania and, desirably, Goodwin prior to closing Gregory Drive to auto traffic.

Selection

The evaluation analyses discussed in the preceding section have attempted to examine as many pertinent considerations as possible. The purpose is to solve problems via solutions that are acceptable and implementable.

The analysis allows the identification of which attributes of each concept may be desirable. It is expected that the recommended plan would be created by a combination of the concepts. Also, parking and circulation elements must fit together along with bicycle, transit, and pedestrian elements to create a total transportation system.

In summary, the following elements are optimal.

1. Springfield Avenue should be improved as much as possible to serve a through street function.

2. Green Street should serve as a collector/distributor function, however, physical constraints may yield unacceptable congestion. The latter would ultimately achieve an equilibrium state (i.e., severe congestion would cause nonlocal motorists to divert to other routes and congestion would settle down to something more tolerable).

3. The transition problems for the Green/Springfield one-way pair are very difficult to solve; costs may over weigh benefits.

4. Transit route splitting is another problem for the Springfield/Green one-way pair. Use of other streets or counter flow is not attractive.

5. Wright Street, Mathews Avenue, and Gregory Drive, special streets (bus, bicycle, and pedestrian) are useful and desirable.

6. Parking Concepts A, B, and C are useable. Concept A can be stageable to the other two. The north satellite lot is an opportunity to be sought; it could function without shuttle bus service. The undertaking of parking garage projects is a long-term possibility. Adopting a plan to use this concept would be valuable for ongoing decision-making and to protect sites.

7. Traffic efficiency can be improved by taking advantage of the current opportunity to coordinate traffic signal improvements. An overall network, with progressive flow could be established.

5.
RECOMMENDED PLAN

The results of evaluation analyses and selection of desirable attributes provide the base for a recommendation. Since the emphasis of Chapter 4 has been on circulation and parking concepts, key elements of the overall plan, the recommendation to be presented in this chapter includes a more comprehensive description of the transportation system.

Plan Elements

The recommended plan includes the following basic elements:

- Traffic circulation system.
- Transit route modification.
- Off-street parking concept.
- Bikeway and pedestrianway modifications.

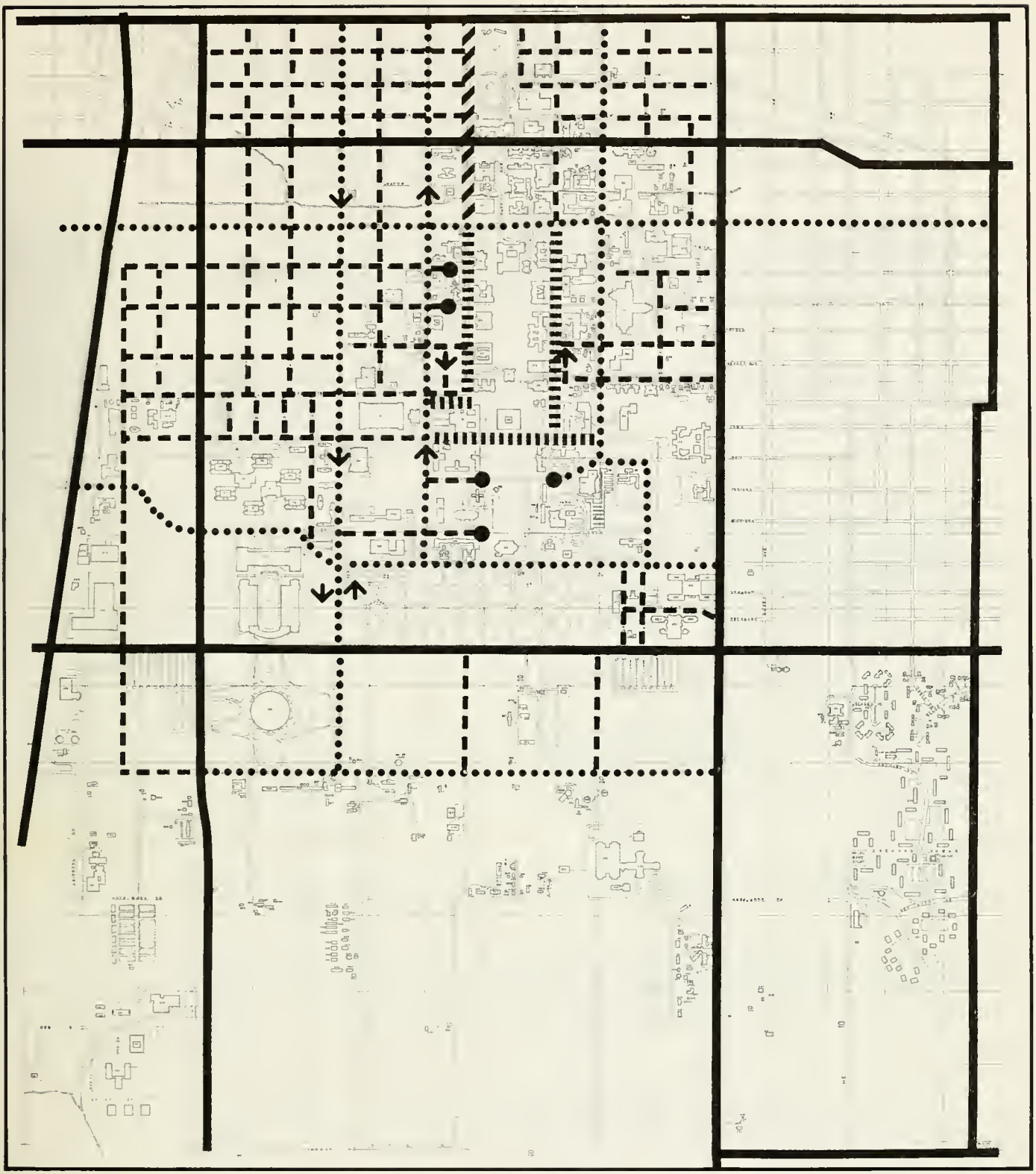
In support of these elements, the plan also includes supporting recommendations and design guidelines. These concern:

- Overall traffic control concept.
- Significant geometric design guidelines.
- Special street design concepts.

Traffic Circulation

Figure 14 illustrates the recommended traffic circulation system. Key features are:

1. *Through Streets.* Springfield Avenue would continue as a major through street; the existing through streets would continue their role, reinforced via certain improvements to provide a framework around the study area. These improvements



UNIVERSITY AREA TRANSPORTATION PLAN

- THROUGH STREET
- MAJOR COLLECTOR
- LOCAL ACCESS
- SPECIAL GATEWAY STREET
- SPECIAL STREET (BUS, BIKE, PED.)
- CUL-DE-SAC

Figure 14
RECOMMENDED CIRCULATION SYSTEM

would include selective widening to develop multiple lane capability (usually four standard width lanes—11 feet minimum), separate left turns in addition to through lanes, improvements to the traffic control system (replace stop signs with traffic signals), develop better progression, use special phasing to accommodate high volume turning movements, and control of on-street parking and bikeways to enhance peak-hour capacity.

2. *Major Study Area Collectors.* Green Street, Goodwin Avenue, Fourth/Sixth, and Peabody/Pennsylvania would be the system of collectors. Because of capacity needs, retention of curb parking, limitations for pavement widening, and desire to minimize pedestrian conflicts, the Fourth/Sixth one-way pair is recommended.

3. *Local Access.* Most of the existing local streets are retained for access. Exceptions are the closure of portions of Lorado Taft and Peabody as part of the south campus development and the creation of special use functions for Wright, Mathews, and Gregory Drive.

4. *Special Streets.* As noted, three special streets are recommended. They would be composite facilities serving bicycle, pedestrian, and bus traffic. Service vehicles would also be allowed. Also, Wright Street between University and Green Street should be developed as an "entry street." It connects University Avenue (major regional route) to the "front door" of the campus (the Union and administrative buildings).

The rationale for the several key recommendations is as follows:

1. *Green Street.* Even though the one-way pair (with Springfield) is attractive for capacity and safety reasons, it is not desirable because:

   a. It emphasizes the through street function in a location where pedestrian conflicts are great.

   b. Entails two difficult design problems that would greatly reduce implementation potential.

   c. Springfield Avenue is the better corridor for a through street for both Champaign and Urbana; it would be more consistent for long-term objectives to begin improving Springfield Avenue for the role via a series of significant projects.

   d. Trying to enhance the Green Street local role is more compatible with land-use boundaries; it does not further aggravate the separation of the north campus.

2. *Fourth/Sixth Street Pair.* Since other functions were desirable for Wright Street rather than continue as a one-way (northbound) street, the one-way southbound operations for Sixth Street need to be changed. Given its pavement width (varying from less than 36 feet to 42 feet) constraints to widening, and peak-hour traffic volumes requiring more than one lane in each direction, Sixth Street as a two-way is not desirable. Pairing it with Fourth Street is the next logical choice since Fifth Street is not appropriate because of physical conditions, limited continuity, and adjacent land-use.

   From an approach perspective, Fourth Street as a southbound facility is efficient. It causes university-generated traffic to enter town from Green Street before entering the more congested campus town area. This induces more traffic at the edge, reducing potential pedestrian-auto conflicts. The fact that Sixth Street does not extend from Florida Avenue is not a liability since its intersection with Pennsylvania is the primary linkage. Moreover, this condition discourages the use of Sixth Street as a through route.

3. *Wright Street.* The concentrations of pedestrians and bicycles and the important need to maintain transit accessibility to the campus creates the very strong case for Wright Street south of Green Street to have a special function, i.e., elimination of general auto circulation. The latter is workable except for the block between Chalmers and Armory where access to one land-use is required (having no other alternative).

   To make this work, the following access changes are needed:

   a. John Street (east of Sixth Street). Terminate street by transitions into parking lots on both sides; auto access to bookstore may be possible through parking lot.

   b. Daniel Street (east of Sixth Street). Redesign street as linear parking lot with parking bay on north side of right-of-way to serve the commercial land-uses.

   c. The Chalmers/Wright/Armory block would have clockwise auto circulation allowed to minimize auto conflicts with other forms of traffic and keep auto drop-off and curb usage to the west side of Wright Street. (Transit would operate in both directions in this block as would be the case north of Chalmers.)

   The creation of a continuous set of three blocks (Green to Chalmers) with the same function would be a safer environment as compared to alternating functions depicted in Circulation Concepts B, D, and E. Each place that function changes is a transition point requiring communication to motorists, bus drivers, bicyclists, and pedestrians. This increases the risk of inappropriate street use or encroachments.

   It should also be noted that separating north-south bus flow from auto traffic in this part of the study aids both auto and bus traffic.

4. *Mathews Avenue.* Even though vehicle and people volumes are less than on Wright Street, a special function which restricts auto usage is recommended for Mathews Avenue from Green Street to Gregory Drive. Two-way transit and bikeways would be developed on the street.

   As Figure 14 shows, certain auto access would be allowed. Clockwise auto circulation would be allowed on Nevada-to-Mathews-to-Oregon. Autos would share the northbound bus lane on Mathews Avenue. A special design treatment is recommended for California Avenue, west of Goodwin Avenue, i.e., exclusive pedestrian and bicycle use. This will be discussed later in this chapter.

5. *Stadium-Pennsylvania Connection.* In order to take advantage of the Stadium Drive approach route (with rail underpass and signalization at Neil Street), the plan proposes connecting this route to Pennsylvania via Peabody. Two crossover connections would be needed. The linkages bring traffic to the southwest corner of the intense activity area and provide distribution along either south or west edges.

Transit Route Modification

Figure 15 illustrates the modified set of transit routes needed to take advantage of the traffic circulation system. All routes except Green route are affected.

The primary changes are to route buses into the two-way special streets—Wright or Mathews. Second, both directions of the Yellow route are located on Mathews to improve balance. Thus, routes are moved from Sixth Street and Goodwin Street in the section from Green to Armory and Green to Nevada.

Because of the objective to employ two-way routes, there will be a need to route buses in the southbound direction on the west side of Sixth Street from Armory to Pennsylvania. Since regular traffic would be flowing only northbound on Sixth Street, this is a counterflow situation for buses. The street has an existing 42-foot pavement in a 66-foot right-of-way. Peak-hour traffic volumes require two lanes or 22 feet to 24 feet of pavement. The bus lane should be 12 feet to 14 feet[1] plus a median strip of up to four feet.[1] This can safely be accommodated. The intersections at Armory and Gregory will have high pedestrian volumes, thus emphasis must be given to crosswalk design and traffic signalization.

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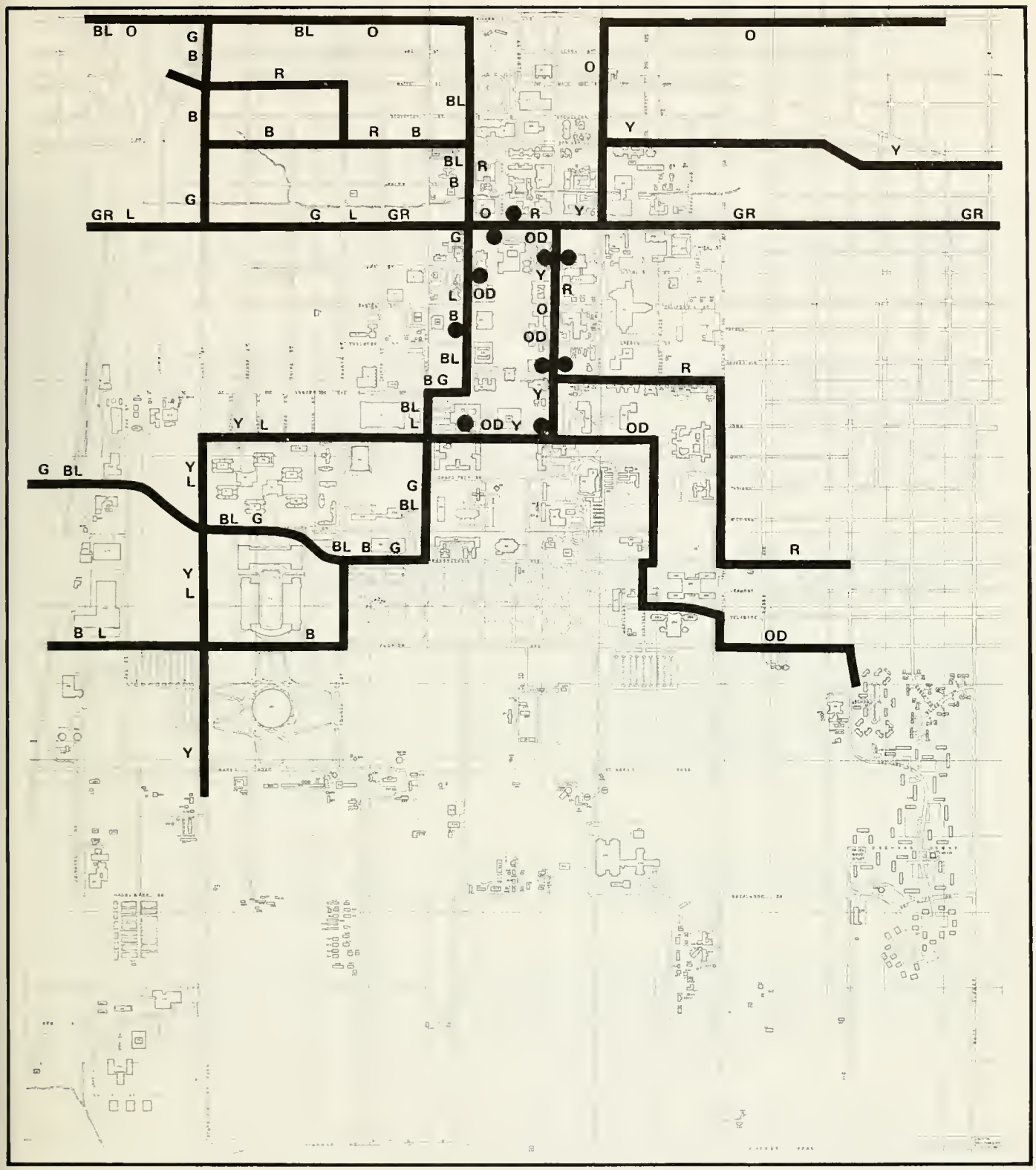
[1] These widths are based upon nominal lane width for buses plus recognizing clearance distance from the curb and width losses due to snow accumulation or rainfall conditions. The median width is large enough to safely hold pedestrians and also be a location for traffic control devices.



UNIVERSITY AREA TRANSPORTATION PLAN

ROUTES:

G–GOLD	BL–BLUE
B–BROWN	L–LAVENDER
OD–ORCHARD DOWNS	Y–YELLOW
O–ORANGE	R–RED
GR–GREEN	● –PROPOSED MAJOR BUS SHELTER

Figure 15

TRANSIT ROUTE MODIFICATIONS

Similarly, a counterflow situation would occur on Nevada Avenue between Goodwin and Mathews. Auto circulation would be westbound, while buses following the Red route would operate in both directions.

Off-Street Parking Concept

Figure 16 illustrates the off-street parking concept. This reflects utilization of all alternative concepts discussed in Chapter 4, except each concept is used only in part.

The features of the concepts would be:

1. Consolidate existing lots in at least three areas to achieve improvements in efficiency, coordinate facility design with new street locations, and to respond to possible site changes in the south campus area. By this means, maximum efficiency can be achieved in providing parking space while minimizing the number of driveways, and complementing pedestrian movements with auto access.

2. Take advantage of the north athletic field site for satellite parking as a traffic management action to reduce demand and circulation on closer-in streets; take actions to protect site for satellite lot expansion at Florida and Lincoln.

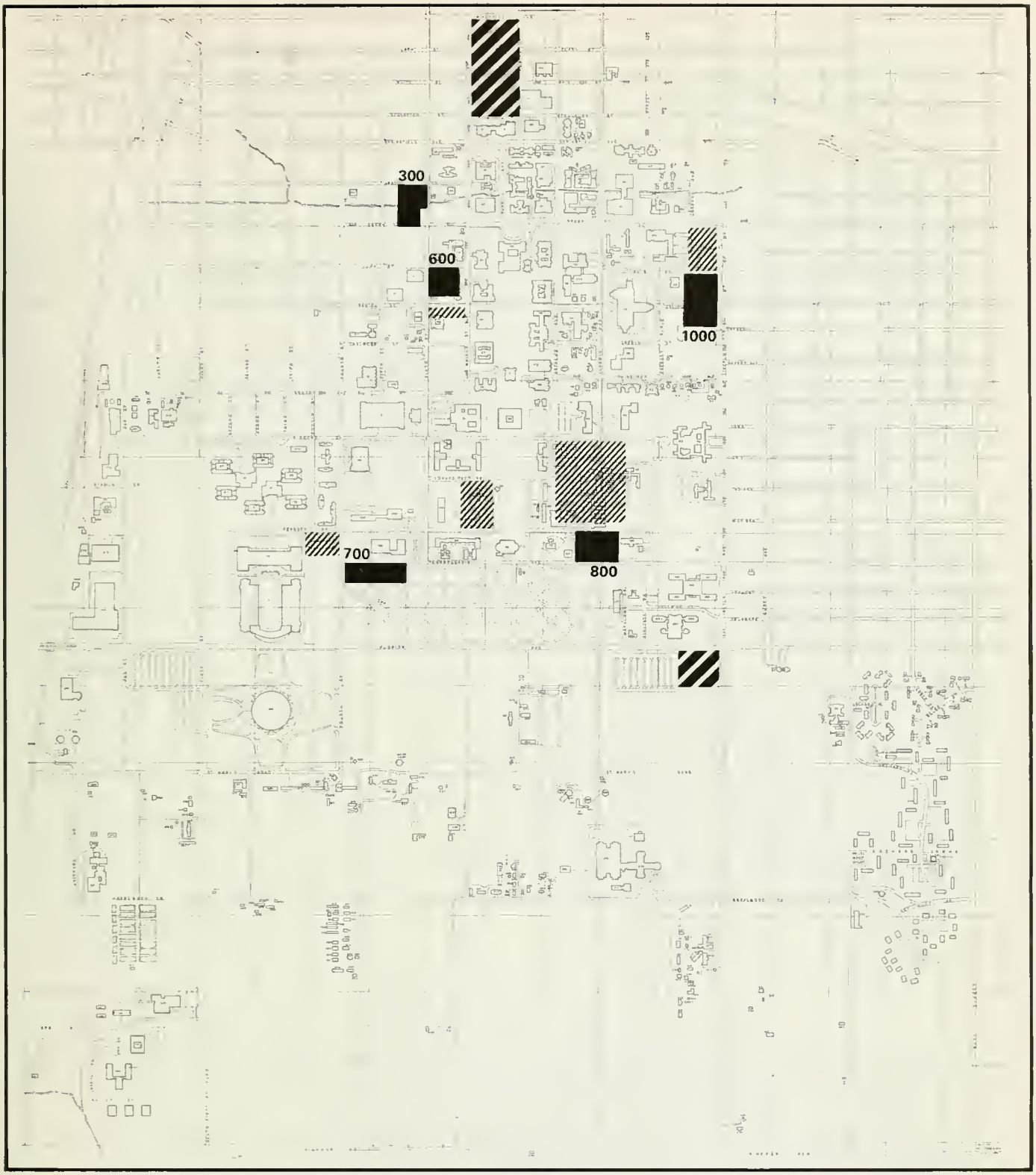
3. The above two steps represent initial actions in an overall strategy to regain control over the parking system (as compared to having it exist or expand in an unstructured sense); this leads toward the development of parking facilities as a long-term solution, the sites for which should be protected (including access locations). Continued expansion of the university's small parking lot system should be curtailed, or at a minimum evaluated with respect to these recommendations.

4. Recommendations do not include university parking structures at this time; the adoption of this concept, however, would benefit decision-makers with respect to other planning decisions.

5. The northwest garage (Lot Number J site) is a special case, demand levels appear to be high enough to warrant consideration of this project; a financial feasibility analysis including a review of funding methods and development packaging should be undertaken to test the scheme in light of current conditions and new or different financial resources.

The rationale for the above was based upon the following considerations:

1. The essence of the program is to provide for a reasonably acceptable (to user) parking system in terms of supply and convenience. In doing so, however, actions are devised to avoid counterproductivity, i.e., stimulating auto use in the face of energy concerns, street capacity limitations, pedestrianization objectives for the study area, and improvements in environmental quality.



UNIVERSITY AREA TRANSPORTATION PLAN

NEW PARKING GARAGE

NEW PARKING LOT (SATELLITE)

AREA FOR PARKING LOT CONSOLIDATION

Figure 16

OFF-STREET PARKING SYSTEM MODIFICATIONS

2. Because parking is a sensitive matter, the concept is evolutionary seeking to take advantages of opportunities to reduce the scatterization of facilities; improve efficiency via turnover in larger, less individualized facilities, and gradually improve the relative attractiveness of non-auto travel.

3. The sites shown for future parking facilities are possible locations based upon site availability. The attempt was to maintain contiguous location relative to collector streets or through streets and be cautious about sites that would generate auto volumes penetrating pedestrian activity locations. In the south campus development area, the structure site is dependent upon final building location decisions and location of the new Goodwin Avenue.

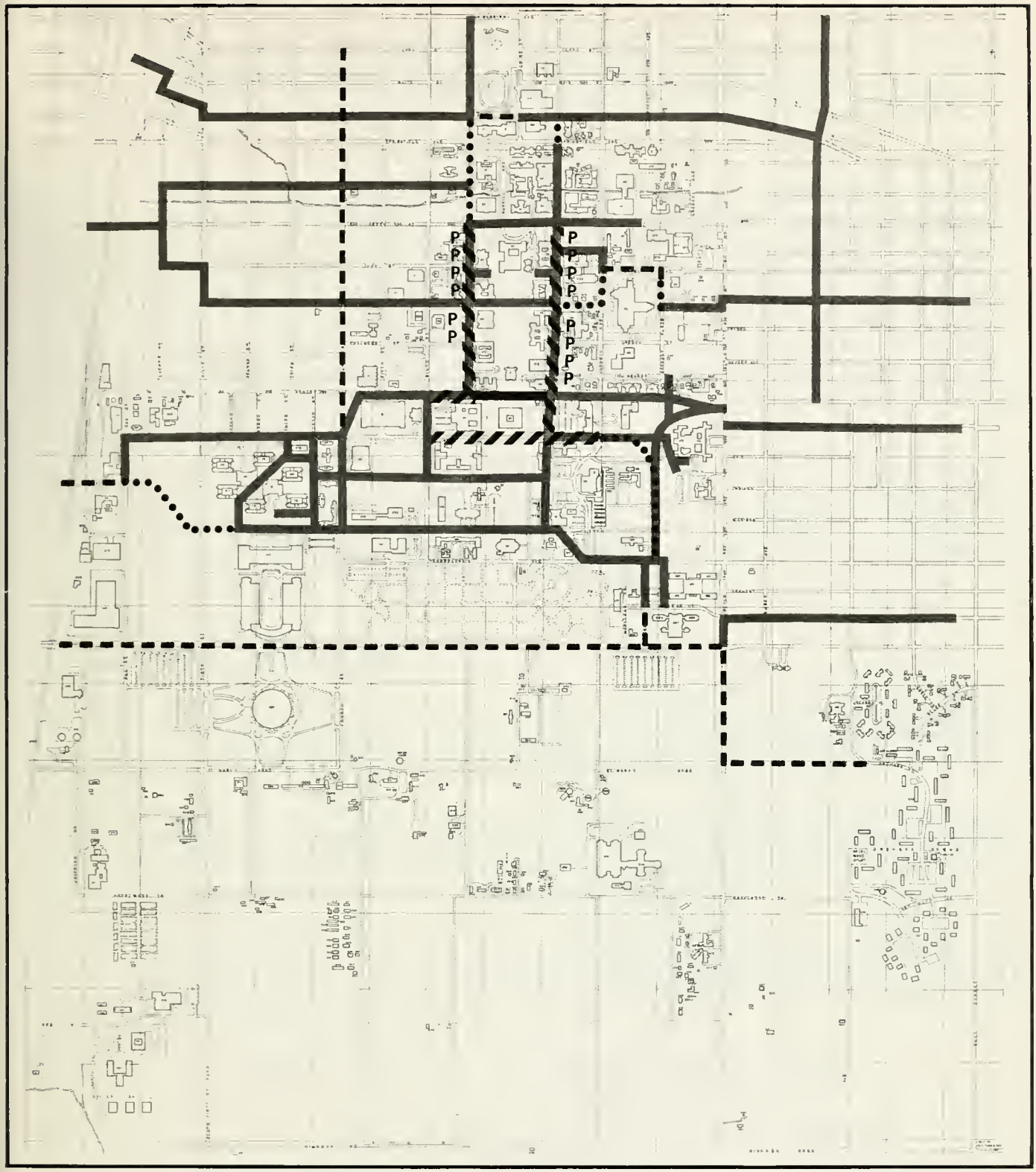
4. The suggested increase in satellite facilities, without other actions (shuttle bus, fee schedule changes, moratorium), recognizes the risk. At a minimum, these sites need to be protected in the university's overall development plan. The athletic field site and Florida/Lincoln site are potentially close enough to north campus and south campus activity areas to be useful. If future parking garages become economically infeasible, these sites will become very important.

The above concepts deal with the physical aspects of the parking system. Operational aspects are also important. One of these could be an increase in the parking fee schedule. This would be an important adjustment in the context of pricing parking according to its value, the value of reuse potential for the land-use by parking facilities, and owning and operating costs of the system.

Beyond this, other management or operating programs warrant consideration, that is, increased ride-sharing, i.e., car-pooling and van-pooling as a complement to regular transit service. Particularly in response to energy limitations, the university should initiate steps to actively promote ride-sharing. Setup and programming information is readily available. Assistance from the state via the Institute of Natural Resources and, possibly, CUUATS is available, if needed by university staff. Ride-sharing could be complemented by preferential parking treatment and parking fee discounts. These concepts would achieve other traffic, safety, and environmental objectives in addition to being a contingency against gas shortages.

Bikeway and Pedestrianways

Figure 17 illustrates modifications in the bikeway/pedestrianway system. These include the special streets as described above. Each would be a combined facility interwoven with a substantial improvement of the environment. As Figure 17 indicates, this proposal adds some new facilities which fill the gaps that now exist. The route extending north along Wright Street would tie together the facilities on Green, Healey, and Stoughton Street. The east-west route in the vicinity of the Natural History building would be relocated to California Avenue, which ties together with the Daniel Street route across the campus. The portion



UNIVERSITY AREA TRANSPORTATION PLAN

— EXISTING BIKEWAY

— BIKEWAY INCLUDED WITH SPECIAL STREET

P P P P — BIKE PARKING INCLUDED IN RIGHT OF WAY

••••• — PROPOSED BIKEWAY EXTENSIONS

— — — — PROPOSED BIKEWAY EXTENSIONS INCLUDED FROM CUUATS BIKEWAY SYSTEM PLAN

— EXISTING BIKEWAY REMOVED

Figure 17

BIKEWAY AND PEDESTRIANWAY MODIFICATIONS

of the California Avenue facility between Goodwin and Mathews Avenues would be designed to have a "mall" character incorporating a pedestrianway and landscaping improvements. Also, two-way bikeways would be incorporated in the design of new street segments, i.e., Goodwin Avenue and the Stadium-Peabody Drive connection.

Further, Figure 17 illustrates bikeway additions contained in the CUUATS Bikeway Plan.[2] These would create the connections to locations beyond the study area. Even though the CUUATS plan shows a bikeway on Springfield Avenue, from Wright Street west, this facility is not shown. The strategy would be to rely on the Stoughton and Healey bicycle routes to serve the bike mode in this east-west corridor. This is compatible with a key study recommendation to use Springfield Avenue as a major vehicle through street. Since right-of-way is limited along Springfield Avenue and widening will be difficult, removal of right-of-way space for bicycles would compound the problem unless part of the normal sidewalk area were allocated to bike use.

The bikeway segment between Wright and Mathews at about the Armory Street position would be eliminated in favor of a new facility along Gregory Drive. This would minimize duplication and provide for better continuity of bike routes balanced with pedestrianway space needs. The remaining elements of the system are as currently proposed in the CUUATS plan.

Special Street Design

As part of both bikeway-pedestrianway and circulation planning, special streets are proposed. In order to test the idea and provide a more detailed view of what such facilities are like, conceptual design studies were undertaken.

Table 11 summarizes design objectives that were used for these studies. The first step in attempting to achieve these objectives was to investigate the alternative cross sections. These are illustrated in Figure 18. The intent is to use the existing right-of-way to accomplish the various functions.

These were evaluated with respect to safety and efficiency. Alternative 2 is deemed to be most desirable. It provides reasonable separation between movement lanes and the one most likely to be respected (i.e., used properly by bicyclists and pedestrians).

The problems with the other cross sections are briefly as follows:

Alternative 1. Dangerous position of bikeway between buses has visibility problems for pedestrian-bicycle collisions.

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[2] Adopted July 13, 1977 by Champaign-Urbana Urbanized Area Transportation Study Policy Committee.

Table 11
PRELIMINARY SPECIAL STREET DESIGN OBJECTIVES

Overall

The Project Area Should Be:

-- Attractive
-- Safe
-- Convenient for users
-- Cost effective
-- Use space efficiently

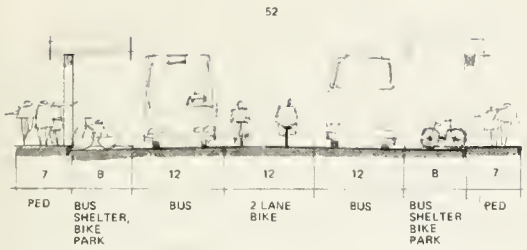
Functional

Provide Following Functions:

-- Bicycle riding
-- Walking
-- Bus access
-- Bus loading and unloading
-- Bicycle parking
-- Service vehicle access
-- Emergency vehicle access

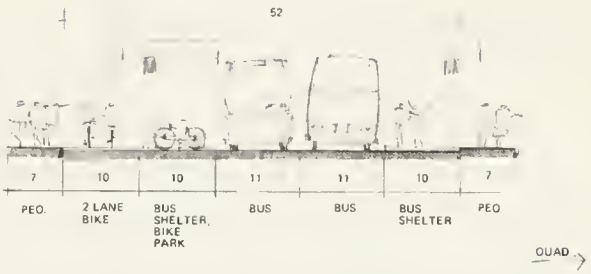
Design

-- Provide adequate space for each function
-- Minimize conflicts among functions
-- Maximize pedestrian comfort and convenience
-- Scale
-- Choices for movement (fine grained)
-- Clearly differentiate between spaces
-- Intended use of space should be clearly understood
-- Link improvement to overall systems
-- Use existing improvements where appropriate
-- High aesthetic standards



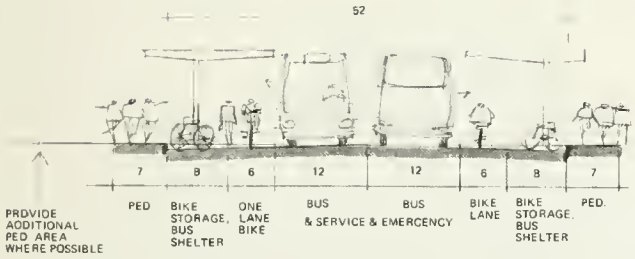
CLASS III BIKEWAY

1, TWO WAY BIKE LANE IN CENTER OF RIGHT-OF WAY BETWEEN BUS LANES. LANE STRIPING DESIGNATES BIKE WAY. BICYCLE PARKING NEXT TO BUSES & PED. AREAS



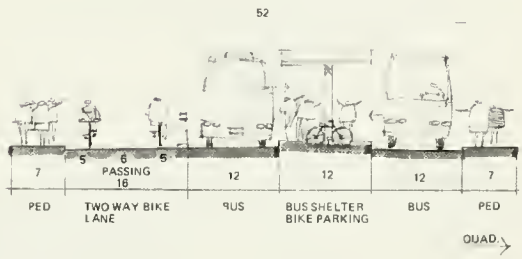
CLASS I BIKEWAY

1, TWO WAY BIKE LANE NEXT TO PEDESTRIAN ZONE BICYCLES ISOLATED FROM BUSES BY BICYCLE PARKING & BUS LOADING AREAS



CLASS II BIKEWAY

2 ONE WAY BIKE LANES DESIGNATED BY STRIPING EMERGENCY & SERVICE VEHICLES UTILIZE BUS LANES BICYCLE PARKING IS ISOLATED FROM BUS BY BIKE LANE



CLASS I BIKEWAY

1, TWO WAY BIKE LANE WITH CENTER PASSING LANE SEPARATED BUS LANE BY ROW OF BOLLARDS. BICYCLE PARKING IN BETWEEN BUS LANES BUS LANES RUN OPPOSITE, "ENGLISH," FOR CENTER LOADING

UNIVERSITY AREA TRANSPORTATION PLAN

Figure 18
PROTOTYPICAL SPECIAL STREET CROSS SECTIONS

Alternative 3. Use one-way bicycle lanes on east side of street; this has high potential of not being used properly with ensuing safety hazards; also bicycle movement next to bus lane has safety problems for bus riders.

Alternative 4. Requires "English-style" bus flow with difficult transition problems at end of special street, persons waiting for buses are in more jeopardized location.

The application of the selected cross section to the three streets is illustrated by Figures 19, 20, and 21. These schemes provide a staggered pattern of bus stops. The locations were selected to serve likely concentrations of people (patrons). However, this is at variance with a policy to stop in every block. The special streets represent a controlled environment in which space has been allocated to many functions. A bus stop every 300 to 400 feet would upset this allocation and unbalance the functions. The landscaping features, location of bus shelters, and bicycle parking areas will control or channel pedestrian flow in a safer manner than exists today (or when Wright Street was closed to traffic).

It should be noted that in implementing these special designs, existing parking supply is reduced. Along Wright Street, the reduction is 60 to 70 spaces; along Mathews Avenue the reduction would be 100 to 110 spaces; and about 30 spaces on Gregory Place.[3] These reductions would be offset by additions provided in the new facilities described for the recommended parking concept. As such, the time coordination between special streets and parking modifications is an important consideration for project staging.

The order of magnitude construction cost[4] for these projects is as follows:

Wright Street	$332,000
Mathews Avenue	350,000
Gregory Drive	95,000

These costs represent a substantial investment in special streets. The justification lies in the increased safety and efficiency, plus these projects represent an environmental renewal for areas where physical conditions (condition of pavement, curbs, sidewalks, etc.) have become substandard.

Traffic Control Concept

An important aspect of the circulation system is the traffic control concept. This would be achieved via an enlarged system of traffic signals operated as an interconnected network. The locations of signalized intersections is illustrated in Figure 22.

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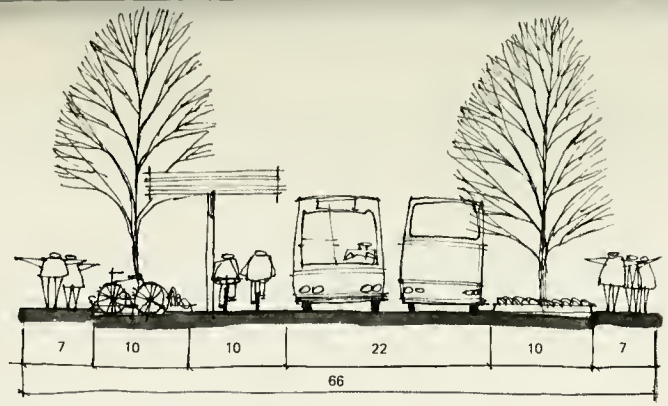
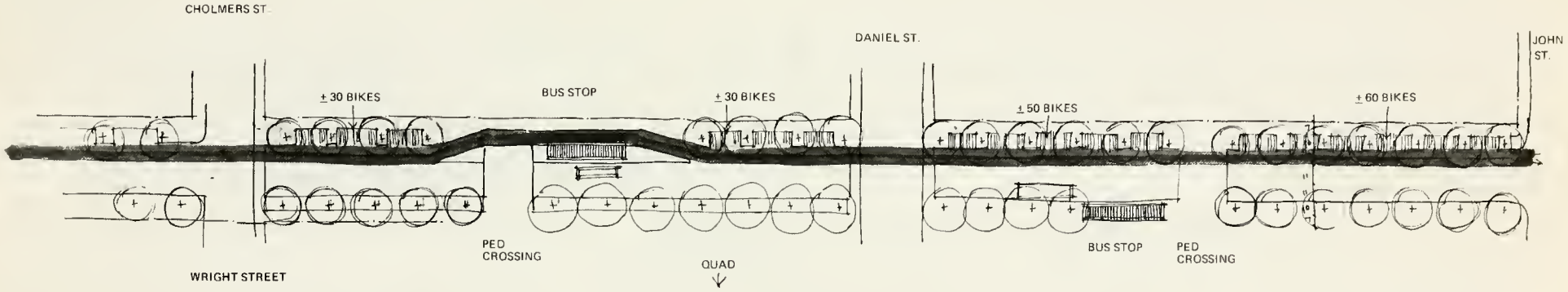
[3] Another 30 to 35 spaces lost by closing Lorado Taft Drive in the campus core.

[4] See Appendix for details.



LOOKING NORTH ON WRIGHT ST.

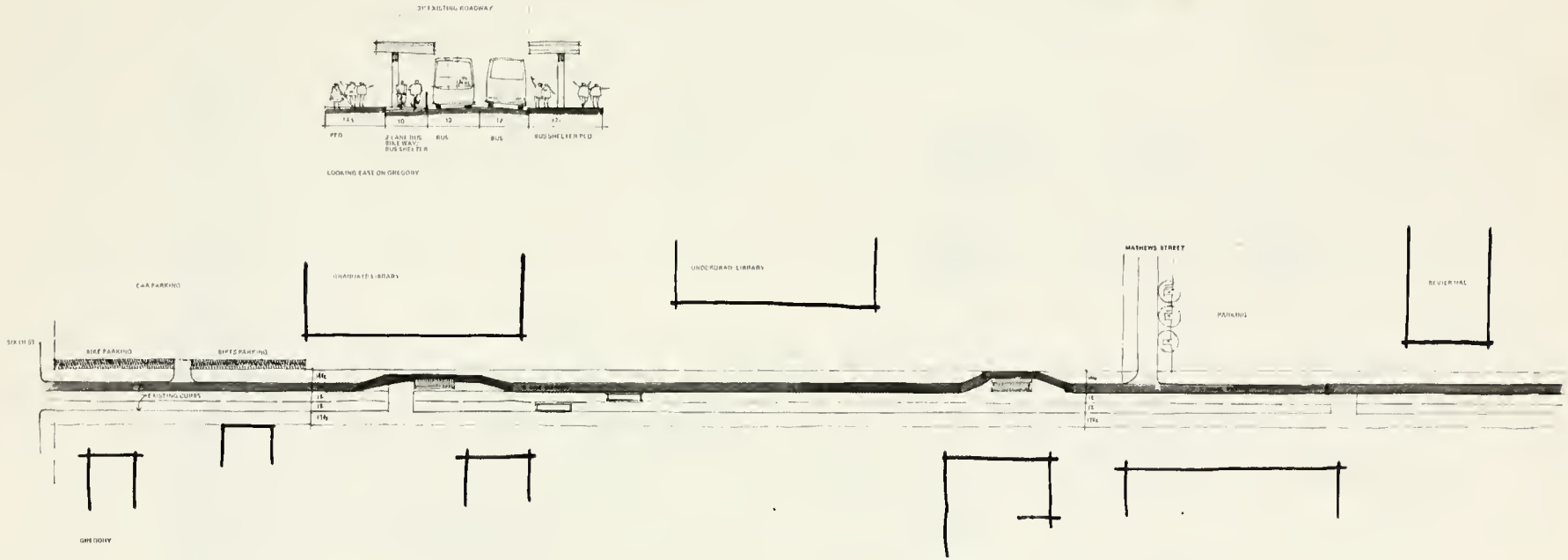


UNIVERSITY AREA TRANSPORTATION PLAN

Figure 19
WRIGHT STREET DESIGN CONCEPT

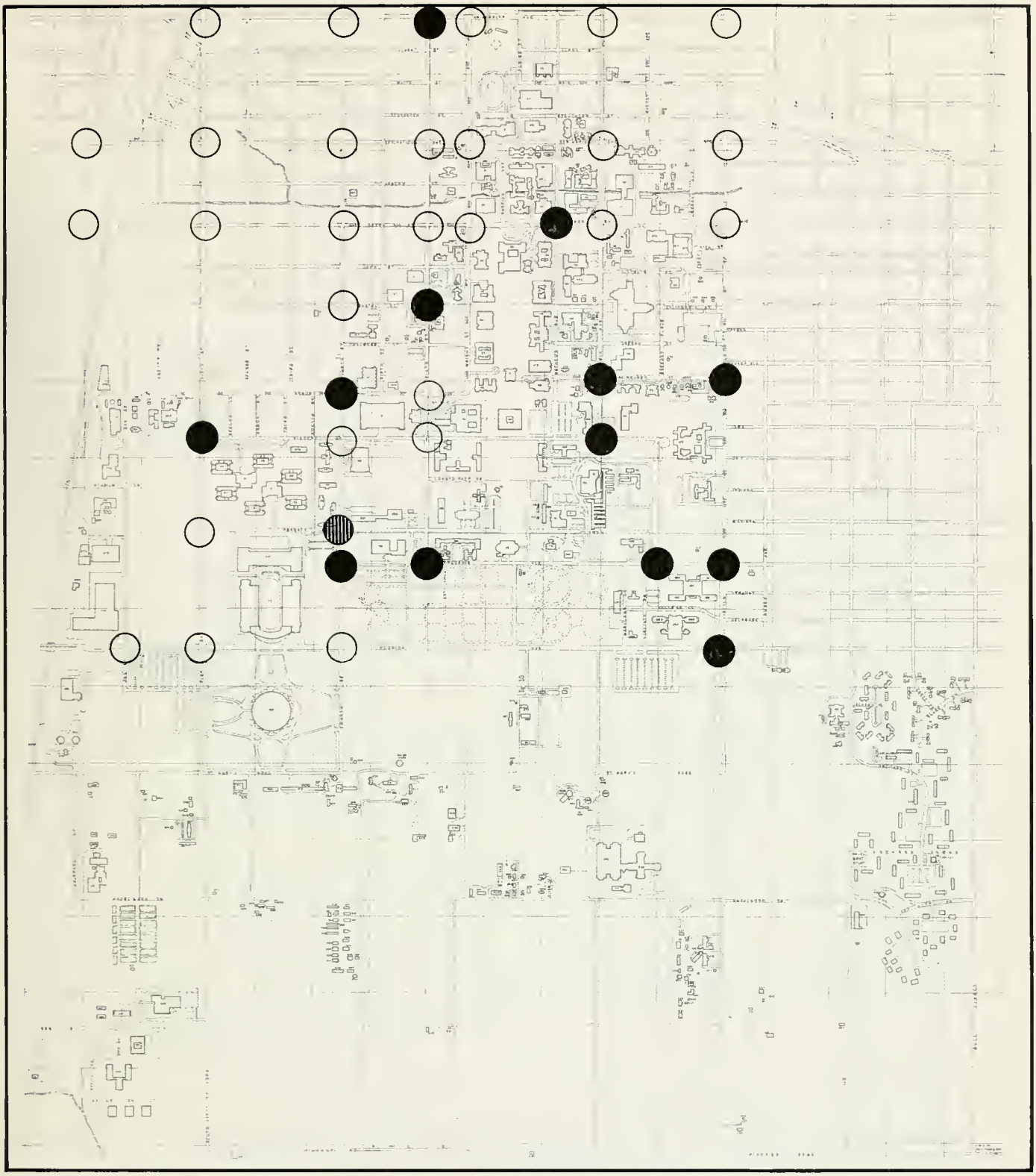
UNIVERSITY AREA TRANSPORTATION PLAN

Figure 20
MATHEWS AVENUE DESIGN CONCEPT



UNIVERSITY AREA TRANSPORTATION PLAN

Figure 21
GREGORY DRIVE DESIGN CONCEPT



UNIVERSITY AREA TRANSPORTATION PLAN

EXISTING SIGNALIZED INTERSECTION

PROPOSED NEW SIGNALIZED INTERSECTION

EXISTING TO BE REMOVED

Figure 22
TRAFFIC CONTROL CONCEPT

In addition to the set of 26 existing signalized intersections, it is recommended that 13 more be installed and one be eliminated. These are:

1. *Sixth at University.* New northbound Sixth Street requires signal control for proper street function and capacity.

2. *Mathews at Green.* Special street design and need to provide bus egress and pedestrian/bicycle protection.

3. *Nevada at Goodwin.* To reinforce function of both streets, provide capacity but protect significant pedestrian crossings.

4. *Nevada at Lincoln.* To reinforce function of both streets and provide needed capacity along Lincoln.

5. *Goodwin at Gregory.* To provide safe movement to and from special streets (Gregory and Mathews).

6. *Goodwin at Pennsylvania.* Provide safe intersection operation with needed capacity, also accommodate large pedestrian crossings from housing area.

7. *Lincoln at Pennsylvania.* Reinforce function of both routes and provide needed capacity.

8. *Lincoln at Florida.* Provide needed capacity and to reinforce study area bypass function for each street.

9. *Sixth at Daniel.* Provide safe crossing for major bikeway and pedestrian crossings, plus allow for commercial traffic egress from Daniel Street.

10. *Sixth at Pennsylvania.* To reinforce function of both routes and more efficiently and safely accommodate turning movements.

11. *Fourth at Armory.* To reinforce street function.

12. *First at Gregory.* To reinforce street function.

13. *Fourth at Pennsylvania.* To provide needed capacity and reinforce new collector street connection; as part of this project, existing signals at Fourth and Peabody would be eliminated.

As part of this enlarged network, operations should be under a single control mechanism rather than the three separate mechanisms existing now. There is an opportunity to achieve this result since both municipalities are already considering or have programmed signal improvements. The scheduling of each installation would be guided by needs as defined by standard signal warrants.

A final aspect of the recommended plan concerns geometric design of significant facilities. The facilities are:

1. Springfield Avenue

   -- Need to develop four lanes at 11 feet.

   -- Need left-turn lane at First, Fourth, Sixth, Wright, and Goodwin.

2. Pennsylvania Avenue

   -- Need to develop four lanes at 40 feet, minimum (44 feet desirable).

   -- If parking garages are to be located along route, there will be a need for left-turn lanes for parking access.

3. Stadium/Peabody and Peabody/Pennsylvania Crossovers

   -- Crossovers should be designed to allow at least 30 mph operation. The intent is to allow traffic to flow at a reasonable safe speed through the intersection to achieve needed traffic flow efficiency (capacity).

   -- Pavement should provide four lanes at 10 feet, preferably 11 feet in intersection approaches.

   -- Incorporate two way (16 feet width) bikeway in Stadium/Peabody facility.

   -- Parking facility at Fourth and Peabody would be redesigned using a portion of the existing Peabody Avenue right-of-way to recreate same amount of parking space.

4. New Goodwin Avenue

   -- New alignment from Gregory Drive to Pennsylvania should contain four lanes at 11 feet (to accommodate transit).

   -- Incorporate two-way (16 feet width) bikeway in facility.

5. Channelized Intersections

   -- Lincoln at Florida.

   -- Goodwin at Pennsylvania.

   -- Sixth at Pennsylvania.

   -- Fourth at Pennsylvania.

   -- These intersections involve substantial turning movements, multiple lane streets, and significant pedestrian volumes.

   -- Design to employ medians and other islands to organize movement paths, provide refuges, and locations for signal poles.

6. Special Transitions

   -- The intersections with special transitions are as follows:

      Green at Wright.
      Green at Mathews.
      Sixth at Armory.
      Sixth at Gregory.
      Goodwin at Gregory.

   -- Require lane alignment through intersections to provide transition bus paths and bikeways.

   -- Crosswalks require special attention.

7. Lincoln Avenue

   -- Along with the signal improvements, lane usage should be changed to recreate continuous through lanes. The left-turn reservation for the inside lane at several locations creates underutilization of the street and delays at locations several blocks upstream from the left-turn lanes.

8. Wright Street Entry

   -- The use of Wright Street from University to Green Street as an entry should be reflected in special design. The pavement width is 52 feet. Consideration could be given to extend the Green Street median concept northward on Wright Street to create the special identity. This should be supported with University of Illinois directional signing along University Avenue, east and west.

Implementation

Implementation concerns a financial plan (based upon improvement costs), agreement as to responsible agency for each project, and a staging of the improvements into workable programs.

The estimated implementation cost of the recommended plan is as follows:

Street Improvements	$ 634,000
Special Streets	777,000
Traffic Signalization	585,000
Parking Improvements	1,550,000
Bikeway and Transit Stop Improvements	143,000
	$3,689,000

This does not include any new parking garages or the cost of an overall computerized or other master control equipment for an intergrated signal network.

To indicate the level of commitment required by each agency, Table 12 summarizes the overall cost estimate for the plan in terms of individual project by agency. This division merely reflects the location of the project. As such, the only projects reflecting multiple-agency participating are the three special streets, Wright Street (north of Green), and Springfield. Each of these were divided equally in half or thirds. It is expected that further negotiation will be needed to refine this relative participation.

There are various financial resources that could be employed for these improvements:

1. *Streets.* Motor fuel tax, FAU, general funds, university funds, and safety funds.

2. *Special Streets.* Motor fuel tax, FAU, UMTA, general funds, university funds, and safety funds.

3. *Traffic Signals.* Motor fuel tax, FAU, and safety funds.

4. *Parking.* User revenues, university funds, and general funds.

Capital budgeting on the part of each participating agency should be undertaken to assess their individual capability to be responsible for various projects. This will entail integovernmental agreements for some projects which cross municipal boundaries.

A possible staging of the improvements is illustrated in Figure 23. This employs a strategy which seeks to alleviate initial safety issues first, enhance the ability of the through street to function at maximum capability, improve parking efficiency, and coordinate with other programmed activities. This staging is not a recommendation, merely a suggestion for initial consideration.

With publication of this report, the next steps to implement the recommendations are suggested as follows:

1. Set up a standing committee of agency policy and staff person to be responsible for project development (design, staging, financial participation). Charge this group with an initial task of developing an overall timetable for implementation.

2. Adoption of plan by four participating agencies.

3. Presentation of plan to MPO for inclusion in regional plans.

4. Discussion and refinement of staging to select the first set of projects.

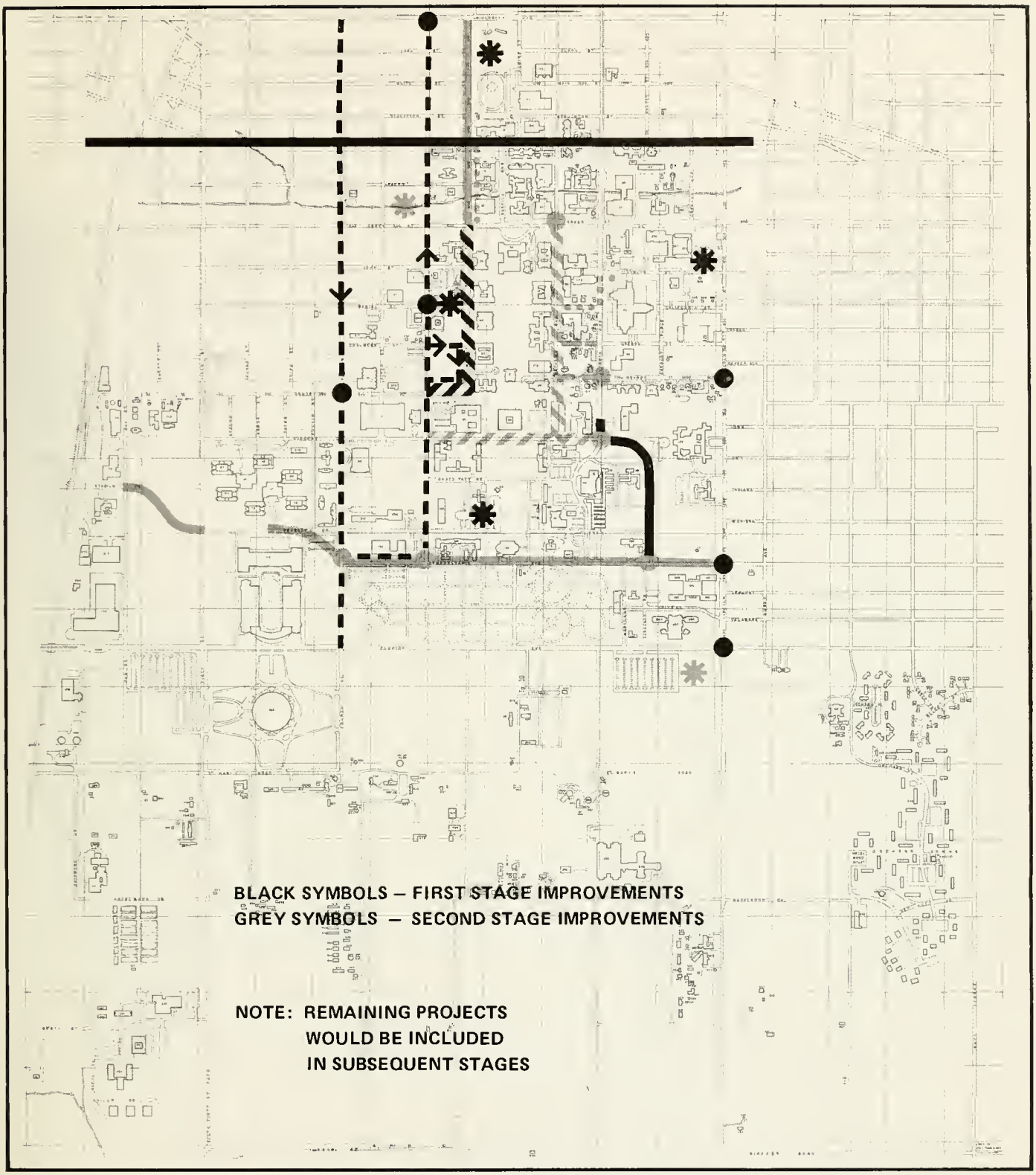
5. Prepare specific project implementation statement (timetable, responsibility, financing plan).

6. Initiate final design activity for first stage projects, and preparation of appropriate funding application of nonlocal funds to be used.

Table 12
ESTIMATED PROJECT COSTS

Project	Implementing Agency				Total Project Cost
	City of Champaign	City of Urbana	Champaign-Urbana MTD	University of Illinois	
Springfield Avenue - Widen	$ 96,000	$ 96,000	$ -	$ -	$ 192,000
Goodwin Avenue - New	-	-	-	98,000	98,000
Peabody/Pennsylvania - New	-	-	-	61,000	61,000
Stadium/Peabody - New	-	-	-	150,000	150,000
Miscellaneous Intersection Improvements	15,000	8,000	-	-	23,000
Wright Street (Green - University)	25,000	-	-	25,000	50,000
Special Streets:					
Wright Street	110,000	-	111,000	111,000	332,000
Mathews Avenue	-	116,000	117,000	117,000	350,000
Gregory Drive	-	-	47,000	48,000	95,000
Daniel Street (Sixth-Wright)	60,000	-	-	-	60,000
New Signalized Intersection	225,000	360,000	-	-	585,000
Parking Lot Consolidation	-	-	-	150,000	150,000
Satellite Parking Lot Expansion	-	-	-	1,400,000	1,400,000
Green Street Bus Shelters	-	-	24,000	-	24,000
New Bikeways	-	14,000	-	105,000	119,000
Total:	$531,000	$594,000	$299,000	$2,265,000	$3,689,000

Note: The division of cost by implementing agency is only based upon location of project and agency involvement (as in the case of special streets). This table is intended to illustrate one possible level of relative participation as a point of beginning for further discussion.



UNIVERSITY AREA TRANSPORTATION PLAN

– STREET IMPROVEMENTS (WIDENING, NEW PAVEMENT, OTHER PHYSICAL CHANGES)

– STREET OPERATIONS CHANGES

– NEW TRAFFIC SIGNALS

– SPECIAL STREET IMPROVEMENT

– PARKING IMPROVEMENT

– BIKEWAY IMPROVEMENT (PROJECTS SEPARATE FROM SPECIAL STREET IMPROVEMENTS)

Figure 23

POTENTIAL STAGING CONCEPT

APPENDIX

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CHAMPAIGN-URBANA SAFETY STUDY

Location: Wright Street--Armory to Green Street

Quantity	Unit	Item	Unit Price	Cost
Plant Material				
96	Each	4" Cal. Shade Trees	$ 600.00	$ 57,600
48	Each	6' Cast Iron Tree Grates	300.00	28,800
2,720	Each	Deciduous Shrubs on 2' Centers	20.00	54,400
430	Sq.Yds.	Pavement Removal	15.00	6,450
1,550	LF	New Curb and Gutter	8.00	4,400
8,000	Sq.Ft.	New Sidewalk	2.25	18,000
375	Each	Bike Racks	40.00	15,000
6,240	Sq.Ft.	Special Paving at 4 Mid-block Crossings	4.00	24,960
1,520	LF	Raised Curb for Planter Beds	12.00	18,240
2	Each	Bus Shelters	12,000.00	24,000
			Subtotal:	$251,850
			+ 10% Miscellaneous	25,000
				276,850
			± 20% Contingency	$ 55,400
				$332,250

CHAMPAIGN-URBANA SAFETY STUDY

Location: Sixth Street to Goodwin

Quantity	Unit	Item	Unit Price	Cost
2,000	L.F.	Remove Curb and Gutter	$ 2.25	$ 4,500
600	Sq.Yds.	New Roadway 3 X 1,800	25.00	15,000
2,000	L.F.	New Curb and Gutter	8.00	16,000
3,000	Sq.Ft.	New Sidewalk	2.25	6,750
2	Each	Bus Shelters	12,000.00	24,000
1,500	Sq.Ft.	Midblock Crossing Paving	4.00	6,000
			Subtotal:	$ 72,250
			+ Miscellaneous 10%	7,250
			Subtotal:	$ 79,500
			± 20% Contingency	15,900
				$ 95,400

CHAMPAIGN-URBANA SAFETY STUDY

Location: Mathews Avenue

Quantity	Unit	Item	Unit Price	Cost
50	Each	4" Cal. Shade Trees	$ 600.00	$ 30,000
50	Each	Cast Iron Tree Grates	300.00	15,000
3,100	Sq.Yds.	Sidewalk Removal 16 X 1,750	6.00	18,600
1,850	L.F.	Removal Curb and Gutter	2.25	4,162
2,850	L.F.	New Curb and Gutter	8.00	22,800
32,000	Sq.Ft.	New Sidewalk 1,850 X 16 + 900 + 1,200	2.25	72,000
450	Each	Bike Racks	40.00	18,000
4	Each	Bus Shelters 6-12K	12,000.00	48,000
425	Sq.Yds.	New Roadway Paving	25.00	10,625
11,500	Sq.Ft.	Bike Parking Area Paving	2.25	25,875
			Subtotal:	$ 265,062
			10% Miscellaneous Costs	26,500
				$ 291,562
			±20% Contingency	58,300
				$ 349,862

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M E M O R A N D U M

PARKING STRUCTURE SITES

Eleven different sites and situations of the Urbana/Champaign campus have been thoroughly surveyed to determine the demand for parking structures. Factors used in these surveys were:

1. In order to satisfy people around this campus, it is necessary to provide parking within two blocks of their office or destination. Figures for faculty/staff and average student occupancy for each building were obtained from the Office of Space Utilization.

2. The parking supply in the area is calculated by taking the number of spaces which are surrounded by a line which connects the farthest buildings considered in 1 above.

3. It was judged that parkers from buildings inside the subject area who use spaces outside the area would be offset by spaces inside the subject area which are used by parkers who come from buildings outside of the area.

4. Demand was calculated for faculty/staff, students, University visitors, occasional conference participants; and in applicable areas, city business district customers, employees, and apartment residents. In short, every class of customer was included.

5. Note that demand was computed to include all that which would be generated by students if parking were available to them, even though this is not the current practice.

6. Demand was calculated to include anyone who might wish to use the facility on a 24-hour basis.

7. The optimal size structure to accommodate the demand was calculated on the basis of strictly lot rental as opposed to individual space rental. Currently available space subtracted from gross demand was calculated on either space or lot rental basis as it now stands.

8. For purposes of this study, 11-hour rental rates of $54/year were used (presently $30). Gate controlled hourly rates of 25¢ the first hour and 10¢ every hour thereafter were used. Overnight parking was calculated at $20/month. Demand will, of course, fluctuate greatly with different rates.

9. In determining cost of structures, no cost was used for either University or city owned real estate. However, private land to be used was included in cost.

10. No attempt was made to determine whether dimensions of sites studied would accommodate optimal size structures calculated.

Following is a summary of demands and costs of possible parking structures on seven sites. Back-up material supporting these figures is available at the Division of Campus Parking. Nine sites and situations are shown in priority order with maximum net demand receiving highest priority. Shown separately are two sites for which demand would increase if Food for Century Three was fully implemented. These may be integrated into priority lists as determined appropriate. The optimal size structure without one or more specific type of demand may be obtained by subtracting type of demand to be eliminated and adding "Other Space Available," which would then not be available, to the net demand.

WFW:mab

5/8/78

LIBRARY U. OF I. URBANA-CHAMPAIGN

PARKING STRUCTURE SITES

	F/S Demand Over Available Spaces	Visitor Demand	Student Demand	Occasional Conference Demand	Business and Apartment Demand	Less Other Space Available	Net Demand and Optimal Size Structure	Cost of Optimal Size Structure
Southwest Corner Sixth and Gregory	310	88	1,749	-	-	121	2,026	$7,597,500
Southeast Corner Sixth and John with Com. Demand	406	121	931	150	411	518	1,501	5,928,850
Northwest Corner Sixth and Green with Com. Demand	183	78	449	100	720	334	1,196	5,231,840
Greenhouse North of E.E. Building (A-10) with Com. Demand	428	90	592	200	317	518	1,109	4,519,175
Southeast Corner Sixth and John without Com. Demand	406	121	931	150	-	518	1,090	4,564,500
Southeast Corner Goodwin and Gregory without Food for Century 3	147	61	959	-	-	106	1,061	4,323,500
Greenhouse North of E.E. Building (A-10) without Com. Demand	428	90	592	200	-	518	792	3,405,800

PARKING STRUCTURE SITES (cont'd)

	F/S Demand Over Available Spaces	Visitor Demand	Student Demand	Occasional Conference Demand	Business and Apartment Demand	Less Other Space Available	Net Demand and Optimal Size Structure	Cost of Optimal Size Structure
West Side of Sixth and Healey with Com. Demand	-	32	186	50	532	238	562	$2,810,000
Northeast Corner Goodwin and Penn. without Food for Century 3	-	25	176	-	-	103	98	Use present lot F-14
Southeast Corner Goodwin and Gregory with Food for Century 3	344	84	1,007	200	-	106	1,529	5,886,650
Northeast Corner Goodwin and Penn. with Food for Century 3	334	53	272	200	-	103	756	3,288,600

Food for Century 3 fully implemented

WFW:mab

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